

Taking Kelvinator's Commercial Story to the Field



These Kelvinator executives are to present Kelvinator's commercial refrigeration and air-conditioning sales plans at distributors' meetings. Top row (left to right): A. U. Saloman, H. T. Tasker, J. K. Knighton, J. A. Harlan, E. T. Layport, B. M. Hanley. Bottom row: E. L. Sylvester, L. G. Estep, H. M. McGaughey, A. H. Reinach, and W. E. Watson.

Kelvinator Group To Actively Push Air Conditioning

(Concluded from Page 1, Column 4) handle a line of household appliances, it did not participate in the Kelvinator national convention for its appliance distributors held here early this year.

One of the convention crews of the commercial division left last week for Portland, Oregon, where the first conference was scheduled for Feb. 1-2. Other cities where the conferences will be held, and scheduled dates of the meeting, are as follows:

San Francisco, Feb. 4-5; Los Angeles, Feb. 8-9; Dallas, Feb. 12-13; Cincinnati, Feb. 22-23; Atlanta, Feb. 26-27; St. Louis, March 1-2; Chicago, March 4-5; Baltimore, March 8-9; New York City, March 10-11; Boston, March 12-13.

At the conferences, which will require a day and a half in each city, Kelvinator's complete plans for residential air conditioning, large and small commercial air conditioning, automatic heating, beverage coolers, water coolers, standard commercial applications, and milk coolers, will be described by the men in charge of the respective divisions.

Heading the crews taking the program into the field will be Mr. Harlan himself, accompanied by J. K. Knighton, sales manager, commercial air conditioning department; H. M. McGaughey, assistant sales manager, commercial air conditioning; A. H. Reinach, sales manager, standard commercial division; L. G. Estep, assistant sales manager, residential air conditioning; E. L. Sylvester, director of Kelvin Home; W. E. Watson, assistant sales manager, standard commercial; and E. T. Layport, office manager, divisional offices.

The 1937 plans and educational material which will be given to the field has been outlined on large oil-cloth charts, which took one of the largest sign-painting firms in Detroit more than a week to prepare. These charts are being carried by the crews in special portable carrying cases.

New products which will be previewed at the conferences have been rushed ahead to the various meetings places.

One of the principal matters to be discussed at these meetings is the new sales and advertising program on air conditioning.

"We have found that while the public accepts the 'idea' of air conditioning and its advantages, they haven't accepted it as a product for which they can justify an expenditure of money," says Salesmanager Knighton.

"So this year we're going to put all our emphasis on the 'economic' value

of air conditioning. We're not going to allow the distributor to consider an engineering or cost proposal until he has made certain that the prospect has been given the full story telling how the installation will be justified on an economic basis."

The New "master" and "standard" distributors set-ups on air-conditioning to afford complete market coverage will be outlined to the field organization, as well as requirements on installation and service set-ups, and sales organization.

In its air-conditioning advertising, the field men will hear, Kelvinator is now shifting from almost exclusive trade paper advertising in the various classifications of the market, to a major use of national mass circulation magazines in order to reach new prospects. A distributor national advertising tie-in plan will also be explained.

Standard commercial refrigeration business will be held up to distributors as being the backbone of all refrigeration business, and figures will be shown to pooh-pooh the saturation bugaboo. Emphasis will be placed on selling a replacement market, and to expansion of existing installations.

On water coolers, the factory executives will stress the two major markets; light duty, consisting of offices, etc.; and heavy duty, embracing factories, stores, and the like. A cooler rental plan will be recommended.

A new sales plan for beverage coolers will be outlined embracing promotion of bottlers' cooperation, elimination of direct selling, trailer demonstrations, and direct mail.

The value of the "Kelvin Home" project as a "leadership in air conditioning" theme will be discussed, and construction and design features of the Kelvin Homes will be described.

Residential air conditioning will be described as the perfect franchise for distributors having Kelvinator air conditioning and automatic heating with existing organization and contractor relations.

The complete setup on promotion for home air conditioning, including national magazine advertising, radio, open house, direct mail, will be outlined.

Gansert to Sell Electrolux In 3 Rhode Island Counties

PROVIDENCE, R. I.—The Gansert Piano Co. has been granted sales rights for Electrolux gas refrigerators in Providence, Newport, and Bristol counties.



WEATHERHEAD

REFRIGERATION PARTS • "ALWAYS BETTER"

THE WEATHERHEAD COMPANY • CLEVELAND, OHIO

Engineers Discuss Smoke Elimination, Housing Problems

(Concluded from Page 1, Column 4) by F. C. Houghten, F. E. Giesecke, Cyril Tasker, and Carl Gutberlet. "Investigations on the Exchanges of Energy Between the Body and Its Environment" (See page 22) were discussed by Dr. Charles Sheard and Dr. M. M. D. Williams.

SOCIAL KNOWLEDGE

Dr. Arthur Cutts Willard, president of the University of Illinois, asserted, in speaking at the society's banquet, that the modern professional engineer must develop a better knowledge of the social and economic problems of the society in which he lives.

"The engineer," Dr. Willard declared, "needs to take a new place in society. He has been too much of an isolationist and not enough of an expansionist." Everything the engineer does has a social or economic implication, Dr. Willard explained, yet in the past, engineers have paid little attention to the effect their work has had on the world at large. "He can and must," Dr. Willard continued, "not only meet his primary responsibility to the technological problems which he faces, but also concern himself with other affairs of society which are dependent upon or affected by his technical activities."

Capt. Richard Reiss, member of the London (England) Housing Authority, explained, before a luncheon meeting of the society, how London had whitened its soot-black "smogs"

through enactment of "adequate legislation and stringent enforcement of the law."

Capt. Reiss emphasized the fact that London's experience with public housing has proved that 95% of the slum families rehoused have kept their homes in good condition. The people of England, he said, regard the expense of \$65,000,000 annually for public housing as well justified in results obtained.

Dr. E. Vernon Hill, Chicago consulting engineer and former head of Chicago's Smoke Prevention Bureau, declared that the answer to the smoke elimination problem is the same anywhere — "inspect, serve notice, sue." Competent engineers should approve the heating plants of all new buildings, Dr. Hill stated, in an effort to make their operation as nearly smokeless as possible. He described a washing process to reduce sulphur and ash content as "hardly worth while."

SMOKE SOLUTION

A speculative solution of the smoke elimination problem was offered by John Howatt, chief engineer of Chicago's Board of Education, who declared that large power and heating units for entire cities would eventually be erected at spots remote from the residence sections. Large heating plants, he explained, have already proven much more efficient than individual units.

At the convention's opening meeting, D. S. Boyden, Boston, was elected president of the society, succeeding G. L. Larson of Madison, Wis. Other officers elected include: E. H. Guernsey, Toronto, Canada, vice president; J. F. McIntire, Detroit, vice president; and A. J. Offner, New York City, treasurer.

SHELF-X

FLAT SURFACED EXPANDED STEEL SHEETS

MAKES BETTER REFRIGERATOR SHELVING

Prove it at our expense



Send for free sample of Shelf-X and make the sliding cup test

Shelf-X has a smooth, flat surface upon which containers can be moved freely without tipping or spilling. Since Shelf-X has no mechanical joints it is sanitary and easy to clean. It supports small objects; yet it permits easy circulation of air.

Also used for Air-Conditioning Screening

Because it has a large open area assuring good air circulation Shelf-X is as good for air-conditioning screening as it is for refrigerator shelving.

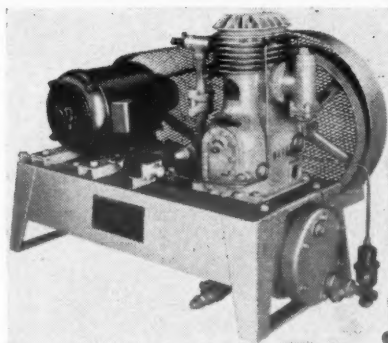
Write for free sample and complete details. Address United States Gypsum Company, Dept. 21-ACR, Steel Products Division, 300 West Adams Street, Chicago. Manufactured by:

UNITED STATES GYPSUM COMPANY
STEEL PRODUCTS DIVISION, 300 W. ADAMS ST., CHICAGO

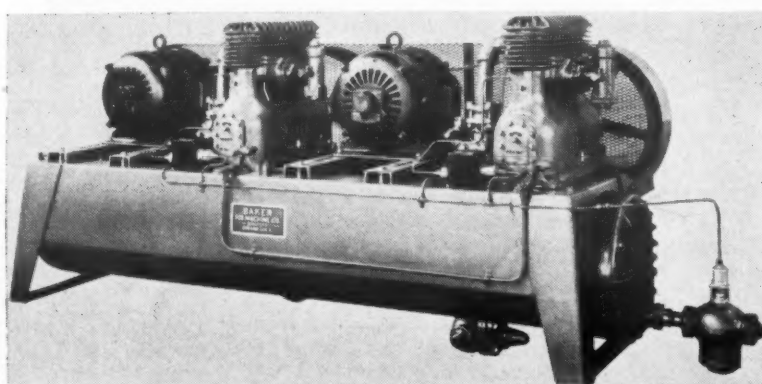
DESIGNED
BY BAKER
especially for
Air Conditioning

44 MODELS

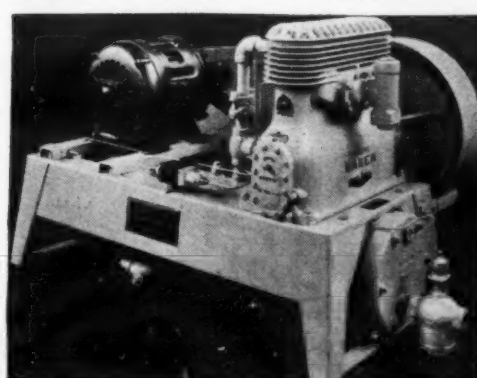
FOR FREON OR METHYL-CHLORIDE
FROM 3/4 to 60 H.P.



Baker Two Cylinder Type, Automatic Self-Contained Unit for Freon or Methyl Chloride. Available in air and water cooled models to 7 1/2 H.P. capacity.



Left—Baker Dual Four Cylinder Automatic Capacity Unit, with Automatic Capacity control for low cost operation with reserve capacity for emergency cooling loads.



Below—Baker Four Cylinder Self-Contained Unit with full automatic control. Designed for Freon or Methyl Chloride. Available in a wide range of capacities.

BAKER

ICE MACHINE CO., INC.

1506 EVANS ST., OMAHA, NEBRASKA

Branch Factories: Port Worth, Los Angeles, Seattle
Eastern Sales: New York Central Sales: Chicago



Authority on Mechanical Cooling for over 30 Years

REFRIGERATION NEWS

Established 1926 and Registered U. S. Patent Office as Electric Refrigeration News
Member Audit Bureau of Circulations. Member Associated Business Papers.VOL. 20, No. 6, SERIAL No. 412
ISSUED EVERY WEEKEntered as second-class
matter Aug. 1, 1927

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'36 Commercial Nema Sales Hit Total of 211,830

Gains of 35 to 40% Over Comparable Figures For 1935 Indicated

DETROIT—World sales of commercial refrigerating and air-conditioning equipment during 1936 totaled 211,830 units, according to reports made by 15 member companies to National Electrical Manufacturers Association.

While comparable figures for total commercial sales are not available for 1935, since Nema published no statistics on air-conditioning equipment or condensing units of more than 1-hp. capacity, a comparison of 1936 figures with those for similar items published for 1935 would indicate that last year's marks in most lines passed those of the previous year by between 35% and 40%.

In the case of commercial condensing units below 1 hp., where figures for the two years are obtainable, the 1936 world sales totaled 102,253 units, a remarkable gain over the 68,494 units reported sold during 1935. Sales in the United States alone totaled 74,571 units during the year, 6,077 more than the world sales figure in 1935, and 28,140 more than the number reported sold during that year in the United States.

Canadian sales of below 1-hp. condensing units jumped to 1,265 during 1936, compared with 1,024 in 1935, and sales of the units to foreign countries totaled 26,405 in 1936, against a 1935 total of 21,039.

Total world sales of condensing units up to 25 hp., the limit covered in the Nema report, were 129,499 in 1936. Of this number, all but 27,246 were in the under 1-hp. classification.

Sizable increases over 1935 marks were established in the sales of (Concluded on Page 2, Column 1)

Wholesalers Group Is Formed in Cleveland

CLEVELAND—Formation of the Cleveland Wholesale Appliance Dealers' Association, an organization whose purpose will be to cooperate with the Cleveland Retail Appliance Dealers' Association in an effort to clean up unsatisfactory trade practices here, was effected recently by a group of household appliance jobbers, manufacturers, and manufacturers' agents.

R. J. Strittmatter, vice president of the Apex Electrical & Mfg. Co., was elected president of the new wholesalers' organization.

Other officers elected are: L. M. Evans of Elliot & Evans Co., Electrolux distributor, vice president; R. H. Bechtol, The Cleveland Distributing Co., treasurer; G. M. Nutter, the Moock Electric Supply Co., secretary.

George W. Walker, secretary and prime organizer of the Cleveland Retail Appliance Dealers' Association, was appointed executive secretary of the new wholesalers' association.

Controlled Air Corp. Has Airtemp in St. Louis

ST. LOUIS—Controlled Air Corp., an independently owned company, has succeeded Airtemp Sales Corp. as distributor of Airtemp air-conditioning equipment in the St. Louis territory.

Formal opening of the new distributorship, located at 3319 Olive St., was held Feb. 1, with consulting engineers, architects, and heating contractors of this area as guests.

At the opening, one of Airtemp's new 3-hp. "all in one" air-conditioning unit, introduced at last fall's National Hotel Association convention in New York City, was put in operation to condition the showrooms (Concluded on Page 2, Column 3)

Value of Industry's Products Up 63% In Two Years

WASHINGTON, D. C.—Manufacturers of refrigerating and ice-making apparatus in the United States showed pronounced increases in both employment and production in 1935 as compared with 1933, according to preliminary figures from the biennial Census of Manufacturers, compiled by Director William L. Austin of the Bureau of the Census, Department of Commerce.

Wage earners employed in the industry during 1935 numbered 37,146, an increase of 40.7% over the 26,398 reported for 1933, and their wages, \$40,514,916, exceeded the 1933 figure of \$24,335,228 by 66.5%.

Value of refrigerating and ice-making apparatus, at f.o.b. factory prices, was \$222,389,463, an increase of 63.4% over the 1933 total, \$136,123,583.

Of the 1935 value, \$118,430,313 was contributed by household electric refrigerators numbering 1,422,484, an increase of 56.9% in value, and 48.7% in number, over the 1933 totals of 956,356 refrigerators valued at \$75,459,555.

More than half the domestic refrigerators manufactured in 1936 were 6-cu. ft. capacity, the report shows. This class contains 875,078 units, compared with 433,434 in 1933. From 6 to 10 cu. ft., production in 1935 (Concluded on Page 2, Column 4)

Graybar Named Hotpoint Distributor in Detroit

DETROIT—Local branch of Graybar Electric Co. has taken over distribution of Hotpoint major electrical appliances in this territory, succeeding General Electric Supply Corp., which several months ago merged with Caswell, Inc., to become General Electric distributor in Michigan.

J. P. Wear, Jr., is manager of Graybar's merchandising department, which will be operated separately from the company's supply department under the distributorship setup. The merchandise department will handle only electric appliances.

1,729,135 Washers Sold In 1936; Gain of 22%

CHICAGO—Sales of 93,532 washing machines during the month of December raised the total annual washing machine sales figure for 1936 to 1,729,135 units, reports J. R. Bohnen, secretary of the American Washing Machine Manufacturers Association.

A gain of 22.31% is shown in the 1936 washing machine sales total as compared with that of 1935.

Ironer sales for the year totaled 180,281 units, a gain of 25.32%.

Hill Markets New Line Of Reach-In Units

TRENTON, N. J.—A new line of reach-in commercial refrigerators, especially designed for hard use in hot kitchens, has just been announced by C. V. Hill & Co.

Seven models are in the line, ranging in capacity from 20 to 68 cu. ft., and built with either overhead or ice maker coils. Five of the larger models are available with three or four doors.

To give added protection against intense kitchen heat, three inches of corkboard, plus one-half inch of low conductivity insulating board, is used for insulation. The insulating board covers the entire exterior, including the framework, with a continuous line of air-tight paneling. Hill engineers assert. Corkboard is protected from moisture both by the waterproof paper and a thick application of hydrolene cement.

Both exterior and interior, including coil chamber and baffles, are of (Concluded on Page 7, Column 1)

Dealers Ready To Refit Units In Cincinnati

Motor Overhaul Will Be Done at Cost; Users Told To Disinfect Boxes

CINCINNATI—More than 3,000 electric refrigerators, submerged or exposed to contamination by flood waters, will have to be cleaned and reconditioned before they are fit for food storage, according to estimates made by a committee of the Cincinnati Electrical Association.

The committee was composed of E. P. Zachman, business manager of the association; Matt Williams, of Crosley Radio Corp., and Harry J. Ulmer, of the business promotion department of the Times Star.

All refrigerators exposed to contamination by flood waters must be thoroughly cleaned with soap and water and disinfected with a strong chlorine solution before being put back into use, Dr. F. K. Harder, acting city health commissioner, has decreed.

The Electrical Association has also warned refrigerator owners in the flooded area that motors must be overhauled and cleaned, and approved by a competent refrigeration service man, before they are used. Members of the association are supplying this service at cost.

All of the city's department and electrical appliance stores are back in full operation, according to reports. Some appliance stores have found it necessary to add to their sales and service staffs in covering the city, because of the replacement demand for appliances.

Frigidaire Produces 4,000,000th Unit

DAYTON—The 4,000,000th Frigidaire came down the production line of the Moraine City, Ohio, plant of Frigidaire Division, General Motors Corp. last Saturday, Feb. 6. Officials of the division witnessed its production and crating.

Entrance of Frigidaire on its fifth million followed completion of a sales volume during the last 12 months that saw more than 500,000 units manufactured and sold, a new record for Frigidaire.

The Frigidaire domestic organization of more than 20,000 dealers and salesmen now is seeing at private previews the 1937 line of products, which will be introduced nationally March 7.

10,000 Units Sold in '36 In Milwaukee Area

MILWAUKEE—Sales of approximately 10,000 electric refrigerators in the Milwaukee area during 1936 were reported by President F. W. Greusel in announcing that the Milwaukee Refrigeration Bureau and its advertising program would be continued this year.

The bureau anticipates that 1937 sales will be between 12,000 and 15,000 units, Mr. Greusel said.

Rates Going Up!

Subscription Rates to News Will Be Advanced March 1

Existing rates for subscriptions and renewals to the NEWS are good only until Feb. 28. See subscription blank on page 28 of this issue for order form and present combination rates on NEWS and various books.

Production Again Under Way in Crosley Plant

CINCINNATI—Production operations on both radios and electric refrigerators were started Monday in the plant of Crosley Radio Corp., according to officials of the company.

A few departments are working under some restrictions, but it is expected that these will be cleared up by the end of this week. In general, conditions are working out favorably, it was said.

Sales of Appliances In Washington State Reported by Utility

SPOKANE, Wash.—Sales of 7,537 electric refrigerators were included in the total of 115,570 units of electrical merchandise sold by cooperating electrical dealers in the territory served by the Washington Water Power Co. during 1936, according to a report issued by Lewis A. Lewis, assistant general manager in charge of sales for the utility.

Total sales of electrical equipment reported by the utility for the year represented a dollar volume of \$3,233,000.

"The sale of these new appliances, and the increased use of appliances previously in operation, raised the average annual kwh. consumption per customer to 1,775 kwh.'s—an average increase of 101 kwh.'s per customer per year," said Mr. Lewis.

With the installation of 2,196 electric ranges and 1,461 water heaters during the year, approximately 25% of the power company's residential customer's homes are now equipped with these appliances, according to Mr. Lewis.

"Installation of 429 home ventilating systems, 36 air-conditioning units, and 922 motor-driven heating plants during the year represent progress in a new field," he declared.

Other individual equipment sales included in the 115,570 unit total were: washers, 6,478; vacuum cleaners, 2,665; portable fans, 2,640; ironers, 666; radios, 17,280; table cooking devices, 1,211; toasters, 7,325; percolators, 6,991; waffle irons, 3,686; cookers, casseroles, and grills, 4,736.

Patman Bill Not to Bar Utility Appliance Sales

WASHINGTON, D. C.—No provision to curb interstate utility companies in their sales of electrical appliances will be included in his pending proposal to restrict manufacturers' retail operations, Representative Patman of Texas is quoted as having stated here last week.

While Representative Patman had intended to include a provision forbidding utility groups operating in interstate commerce from selling appliances under certain conditions, the provision seemed to have no effective place in the pending bill, and will be shelved for the present, he declared.

"The main provisions of my new bill are important enough to deserve the full attention of those who will consider it," Representative Patman explained. "It seems best at this time, therefore, to abandon the idea of curbing appliance sales by utility companies, and thus avoid obscuring the issues involved."

New Crosley Distributor In Birmingham, Ala.

BIRMINGHAM, Ala.—Alabama Dry Goods Co. has been appointed distributor in this territory for Crosley refrigerators and radios.

This new distributor succeeds Perfection Mattress & Spring Co., which gave up the line to devote full time (Concluded on Page 2, Column 3)

Strike Tactics Close Offices At Kelvinator

Sitdowners Bar Doors, Use Violence; Service Dept. Votes Against Strike

DETROIT, Feb. 9—The so-called "sitdown" strike at Kelvinator division of Nash-Kelvinator Corp.'s main plant on Plymouth Road here took its first turn toward violence today (Tuesday) when strikers holding the plant and picketers forcibly prevented office workers and officials of the company from entering the plant when they reported at the Administration building this morning, the first time the office force has been stopped from functioning during the week-old strike.

Strikers had jammed chairs into the revolving door at the front entrance, and were said to have welded shut the side doors to the administration building. Police officers made no attempt to force a way through the picket lines for company officials, as they had done yesterday morning. One office worker who tried to break through was forced back.

It is reported that only a few more than 100 workers participated in the original "sitdown" strikes. H. G. Perkins, vice president of the company, estimated the union membership in the plants at 285.

An offer by the company to hold a parley with the strikers was voted down this afternoon by the strikers. Reason for the turn down of the offer, the strikers said, was that conditions of the offer made by the company barred Matthew Smith, secretary and organizer for the Mechanics Educational Society of America, the independent union whose members in the Kelvinator factory fomented the strike.

Workers at the Fort St. plant of Kelvinator Corp., in which service and repair work is done, this afternoon (Tuesday) voted against going on strike. Upon hearing results of the vote, Organizer Smith is said to have stated:

"It don't make any difference, we'll close the plant up tomorrow anyway."

At the meeting preceding the vote, Smith was attacked verbally by many of the workers, who were said to have resented Smith's methods and the statement credited to him that the "workers in the Fort St. plant are a bunch of old ladies."

The union demands include recognition of the Mechanics Educational Society of America as the collective bargaining representative of the workers, a wage increase, and abolition of the bonus system.

With respect to the demands of the strikers, the Kelvinator division of Nash-Kelvinator Corp. made the following statement:

"This situation does not hinge upon Kelvinator's relationship to its men. It is symptomatic of a trend of which these few men are the victims. We cannot possibly ascribe to any act of ours the present sit-down of 112 men out of 2,500 workers at the plant involved, which has stopped production there for the time being."

"Kelvinator is proud of its labor policy and the facts which bear out this policy. Today, the average rate per hour of all hourly rate employees is \$.804, \$32.16 per week of five days of eight hours. The average rate per hour for men is \$.845, \$33.80 per week of five days of eight hours."

"The Michigan Department of Labor and Industry through Theo Jacka, its statistician with headquarters in Lansing, gives the average weekly wage in the Electrical Machinery Industries for Wayne County for December, 1936, as \$29.93. This compares with \$33.80 average per week for Kelvinator men and \$32.16 average per week for all workers."

"For the entire year of 1929, the (Concluded on Page 2, Column 3)

Nema Water Cooler Sales of 21,075 are Reported for 1936

(Concluded from Page 1, Column 1)
water coolers, ice cream cabinets, and bottle beverage coolers, the report shows.

Water cooler sales for 1936 totaled 21,075, against a mark of 15,704 in 1935. In the ice cream cabinet field, 1936 sales were 30,525, compared with 17,257 in 1935. Last year's beverage cooler sales totaled 33,290, compared with a 1935 total of 23,008.

In other lines of commercial equipment, unreported for 1935, milk cooler cabinets showed 2,609 sales—1,972 in the United States and 636 in foreign countries other than Canada, where only one such unit was sold.

Self-contained air-conditioner sales for the year were 5,235 units, to lead that field by a wide margin. Floor-type conditioners registered 3,035 sales during the period; ceiling-type units, 2,562; and residential type, 236.

Sales of commercial and air-conditioning equipment by Nema companies totaled 8,626 units in December, of which 5,269 were in the United States alone. Sales of condensing units only totaled 7,702 units.

Although sales in general commercial equipment were rather light during December, several items registered creditable marks. Among these were pressure water coolers, with sales of 532 units; ice cream cabinets, with 313 unit sales; beverage coolers, with 366 units; and self-contained air conditioners, with 346 units.

'Mystery' Package



S. M. Schweller, Frigidaire assistant chief engineer, hands Capt. L. G. Fritz, eastern operations manager of TWA, pilot of the first regularly scheduled plane out of Dayton airport, a "mystery package" to be used by Twentieth Century-Fox in a forthcoming movie. The occasion was the thirty-third anniversary of the first airplane flight by the Wright brothers.

Kelvinator Issues Statement about Strike Demands

(Concluded from Page 1, Column 5)
average rate per hour for all hourly rate employees in the Kelvinator plant was 70 cents. Today's wages are the highest in the history of the company.

"Kelvinator has consistently attempted to carry out labor policies of wages and hours better than the average for comparable work in similar lines of manufacture in Detroit. That this policy of wages and hours was sound is indicated by the fact that in the history of the present regime there has never been a shut-down of its plants due to labor trouble.

"Kelvinator appreciates that its success is dependent upon the happy relationship of management and men and the public. Kelvinator on Dec. 1 gave its men a substantial wage increase. On Dec. 24 it gave its workers a special payment up to \$55 each depending on their years of service.

"This sit-down situation can only be regarded as a symptom of present day conditions. It is believed that a knowledge of the facts in the case by those most concerned will lead to a speedy solution of the situation."

Heads of the union have made threats to call strikes at the company's plants in Grand Rapids, and newspaper reports said that some of the strikers were sent to Grand Rapids to talk to workers there.

While the MESA claims to be an independent union, not affiliated with either the Committee for Industrial Organization (CIO) which called the sit-down strikes in the General Motors automotive divisions, or the American Federation of Labor (AFL), some observers placed significance on the statement by Harry Spencer, organizer for the United Automobile Workers (a CIO affiliate) in Grand Rapids, that "a majority" of the workmen in the metal plant of the Leonard division are organized by the UAW.

Spencer is reported as saying that after the Flint and Detroit strikes were settled, an effort would be made by the UAW to organize Grand Rapids metal trades workers.

Cameron to Head G-E Dept. Store Division

CLEVELAND—Ralph Cameron has been appointed manager of the department store sales division of the appliance and merchandising department of General Electric Co.

For some time he has been in charge of department store activities on G-E kitchen appliances, and to these duties now has been added the responsibility of sales of all other household appliances, such as laundry equipment, radios, and smaller home appliances through department stores and furniture stores.

Mr. Cameron has been connected with G-E appliance sales for the past seven years. He was first in charge of wholesale activities for the Willis Co., General Electric distributor, in Canton, Ohio. In 1932 he joined the G-E organization in Cleveland in charge of department store activities for the G-E refrigerator and later for the range and dishwasher.

Operating Models on Floor Of St. Louis Airtemp Office

(Concluded from Page 1, Column 1)
and lower offices of the company.

This is in accordance with the company's policy to show its prospects summer and winter conditioning equipment in actual operation under regular conditions.

Harry Milton is chairman of the company's board of directors; A. S. Wright is president, J. L. Weiner is treasurer, C. M. E. Reeves, vice president, and H. W. Buschman, secretary and general manager.

Detroit NAPRE To Meet Feb. 12 at News Offices

DETROIT—Michigan Chapter No. 1 of National Association of Practical Refrigerating Engineers will hold its regular meeting Friday, Feb. 12, at the home of Air Conditioning and Refrigeration News, George F. Taubeneck, editor of the News, will be the principal speaker. Dinner will be served at 6:30 p. m.

A Sea-Going Salesman



Ed Wilcox, Kelvinator export manager, rides the waves in his own cruiser to get his sea legs back before starting on another trip across the seas.

Census of Refrigerating Makers Shows Increase Over 2-Year Period

(Concluded from Page 1, Column 2)
totalled 535,718 units, compared with 416,310 in 1933; over 10 cu. ft., the figures were 11,688 units in 1935, and 10,062 in 1933.

Ice refrigerator production during 1935 is given in the report as 308,976 units, valued at \$6,661,951, in 1935, compared to 223,252 cabinets valued at \$3,305,663 in 1933.

Mechanical refrigerator cabinets of the domestic type, offered for sale separately, totalled 314,394 in 1935, against a total of 441,278 in 1933. Cabinets up to 10 cu. ft. capacity were almost evenly divided in the 1935 total, with 156,294 under 6 cu. ft. and 145,579 from 6 to 10 cu. ft.

Self-contained water coolers manufactured in 1935 totalled 17,954, for a value of \$1,898,420; self-contained ice cream cabinets totalled 14,220, valued at \$2,062,034. This compared with 1933 ice cream cabinet production of 3,499 units, valued at \$613,522.

Commercial refrigerators and display cases of the self-contained type showed production of 26,284 in 1935 against 3,945 in 1933. Value of production was \$2,399,268 in 1935, and \$540,944 in 1933.

Compressors and miscellaneous commercial equipment showed the following production and value figures for 1935:

Complete systems, without cabinets, 12,240, valued at \$11,046,989; high and low sides made for sale separately, 252,634, valued at \$7,405,406; compressors made for sale separately, 54,875, valued at \$3,910,311; evaporators made for sale separately, 67,985, valued at \$1,573,176.

Commercial refrigerator cabinets, 13,789, valued at \$1,151,245; compared with 1933 production of 17,667 units, valued at \$1,128,612; display and storage cases, 7,783, valued at \$3,561,761, compared with 8,425 units, worth \$3,575,995, in 1933; and remote water coolers and fountains, valued at \$1,295,833 in 1935, compared with \$280,747 in 1933.

Industrial refrigerating equipment showed a production total of 5,375 units in 1935, against 3,557 in 1933.

Production of self-contained air conditioners totalled 3,048 units in 1935, for value of \$648,825. Systems not self-contained totalled 5,821 units for the year, valued at \$1,655,785.

Production of absorption-type refrigerators, custom-built units, and other special units was not reported for either year. Value of 1935 production, however, was \$29,825,440, compared with \$14,595,379 in 1933.

VIRGINIA SMELTING Company
WEST NORFOLK, VIRGINIA
131 STATE ST. BOSTON-76 BEAVER ST. N.Y.

EXTRA DRY
ESOTOOL
LIQUID SULPHUR DIOXIDE
V-METH-L
VIRGINIA METHYL CHLORIDE

Ditlevsen to Sell Own Line of Units Here and Abroad

NEW YORK CITY—Ditlevsen & Co., 75 West St., for several years foreign sales manager for Universal Cooler Corp., has discontinued its connection with that firm and is placing on the market in the United States and foreign countries its own line of refrigerating equipment, under the trade name "Ditlevsen."

For distribution in this country the company has a line of commercial condensing units of from 1/4 to 2 hp., both air and water cooled, as well as bare compressors and a direct-drive condensing unit, operated with 1/2-hp. motor, for installation in household refrigerators.

Design of the household unit makes it adaptable to practically any refrigerator, the company claims. It is particularly adapted as a replacement for obsolete hermetic units, according to Ditlevsen company engineers.

In the foreign market, besides the equipment listed, the company is offering five household refrigerators with capacities of 3, 4, 6, 7, and 9 cu. ft., all operated with the direct-drive condensing unit.

Ditlevsen is foreign sales manager for C. Nelson Mfg. Co., manufacturer of ice cream cabinets; Victor Products Corp., makers of electric milk cabinets and icemakers; and Trane Co., manufacturer of air-conditioning equipment. The company also exports evaporating coils and other low side equipment, expansion valves, and other refrigeration and air-conditioning accessories.

SHELF-X

FLAT SURFACED EXPANDED STEEL SHEETS

SHELVING ADDS "SALES APPEAL" TO REFRIGERATORS



Send for free sample of Shelf-X and make the sliding cup test

Shelf-X shelving provides an important talking point for selling refrigerators. Because of its smooth flat surface Shelf-X permits the sliding of containers in any direction without tipping or spilling. And its attractive diamond design not only adds beauty to the refrigerator but also furnishes proper support for small as well as large objects.

Ideal for Air-Conditioning Screening

The large open area of Shelf-X assures free circulation of air therefore it is as good for air-conditioning screening as it is for refrigerator shelving. See for yourself the many advantages of Shelf-X. Send for free sample and complete details. Address Department 21-ACR.

Manufactured by:

UNITED STATES GYPSUM COMPANY
STEEL PRODUCTS DIVISION, 300 W. ADAMS ST., CHICAGO

PELCO makes and releases its own floating ice in upper compartment. Cools quickly and uniformly.

PELCO Electric Beverage-Food COOLER
Cools faster because it makes FLOATING ICE

Cools bottled beverages from room temperature to desired degree in approximately 30 minutes . . . cools every bottle to the same degree. 9 stages of cold control—the owner chooses the temperature at which PELCO operates . . . a money-maker for tap rooms, hotels, restaurants and lunch rooms—anyplace that sells food and bottled beverages is a prospect. Requires no installation . . . simply plug into any light socket.

Another Exclusive
SALES ADVANTAGE

2 units in 1! The fastest bottled beverage cooler made plus an efficient refrigerator for foods or for pre-cooling bottled goods.

Complete Line—PROFITABLE VOLUME at once!

Just count the prospects near you! PELCO has a complete line—a size to meet every requirement. Designed and produced by a reliable concern maintaining precision standards—backed by aggressive merchandising helps.

Write or wire Dept. A-27 for full details.

Refrigerator Division
PORTABLE ELEVATOR MFG. CO.
ESTABLISHED 1899
BLOOMINGTON, ILLINOIS

Leonard Appoints Three Men to Field Staff

DETROIT—Appointment of three additional field representatives of the merchandising division of the Leonard Division of Nash-Kelvinator Corp. was announced last week by R. I. Petrie, sales manager. Leonard added three men to its field staff just prior to its distribution meeting last December.

The new appointees, who will be under the direct supervision of E. R. Berkeley, Leonard merchandise manager in Detroit headquarters, are: Norman C. Macdonald, operating in the New York area; E. E. Brammer, working out of Wichita, Kan.; and Arthur P. Matthews, functioning in the San Francisco district.

Mr. Macdonald, whose territory will include Philadelphia, New Jersey, part of New York State and all New England, has had wide experience in merchandising as field representative for Atwater Kent Mfg. Co.

Mr. Matthews was active in sales and sales promotion for Radio Corporation of America for more than a decade before joining Leonard. His territory will include Washington State, Oregon, Idaho, part of Montana, Utah, Nevada, Arizona, and California.

Mr. Brammer has been active as retailer, wholesaler for distributors, branch manager, factory representative, and before coming to Leonard was wholesale representative for O. K. Spurrier in Oklahoma City. He will cover territory from Wyoming to Texas, including Colorado, Oklahoma, Texas, Kansas, Nebraska, Iowa, Mississippi, Arkansas, and part of Louisiana.

Hall Is Promotion Manager For Baltimore Norge Outlet

BALTIMORE—I. F. Hall, former manager and buyer for refrigeration activities of Hochschild, Kohn & Co., Baltimore, and more recently supervisor for refrigeration activities of Hecht Bros. department store, has been appointed educational director and sales promotion manager for Norge activities of the Joseph M. Zamoiski Co., Norge distributor for this area.

J. Schleisner, formerly connected with Long & Short, Federalburg, Md., refrigeration and appliance dealers, has also joined Zamoiski's Norge sales staff and will cover the Eastern Shore.

Mr. Hall had headed the refrigeration activities at the Hochschild, Kohn department store ever since refrigeration became a major department of the company, leaving about a year ago to work for the Hecht store.

Brooks Radio, St. Louis, Adds Estate Range to Line

ST. LOUIS—Estate electric ranges have been added to the stock of Brooks Radio & Appliance Co.

The Brooks Co. now handles a complete line of electric kitchen appliances including Grunow, Stewart-Warner, Hotpoint, and Crosley refrigerators, Hotpoint and Universal electric ranges, and Estate gas ranges.

The store has been completely remodeled, including addition of new floor and window displays and a new tile front.

Kane Co. Succeeds Worthington As S-W Cleveland Outlet

CLEVELAND—The Kane Co. has taken over distributorship of Stewart-Warner refrigerators and radios in the Cleveland and Columbus territory, succeeding the George Worthington Co., which had been carrying the line for the past five years.

Initial showing of 1937 products was held by the new distributor at a meeting last fortnight in Hotel Carter.

Five Commonwealth Edison Salesmen Awarded Watches

CHICAGO—Five salesmen of the Commonwealth Edison Co. were awarded gold watches by Frigidaire Corp. for their sales of household refrigerators in 1936.

Watch winners were Matthew Baker, William Grieg, Louis Litman, John Pinches, and Alexander Smothers.

Major Appliances, Miami Gets Leonard Franchise

MIAMI, Fla.—Major Appliances, Inc., has been appointed distributor of Leonard electric refrigerators in the state of Florida, according to W. D. Rowlands, head of the organization. The company also distributes Easy washers and Roberts & Mander gas and electric ranges.

Bard & Barger, Inc., G-E Distributor, Split Up Into Two Concerns

COLUMBUS, Ohio—Bard & Barger, Inc., distributor of General Electric products, has undergone reorganization in which two new corporations have been formed. They are: Bard, Inc., of Columbus, and Barger, Inc., of Cincinnati. The new setup became effective Feb. 1.

R. T. Bard, president of Bard & Barger, Inc., is the president of Bard, Inc., and Turner Barger, vice president of the old firm, is president of Barger, Inc.

L. V. Homsher, secretary-treasurer of the old firm, will serve temporarily in that capacity for both new firms. Ralph G. Martin is a director with Mr. Homsher and Mr. Bard in Bard, Inc., while Clyde M. Abbott, Cincinnati, with Mr. Homsher and Mr. Barger will constitute the board of directors for Barger, Inc.

Under the new organization, Bard, Inc., will have 37 central Ohio counties, including the Springfield area, from the Ohio river north to Marion. Nine counties of Ohio, five of Indiana, and seven of Kentucky will comprise the territory of Barger, Inc.

Newark Branch of Wesco Moves

NEWARK—To handle increasing business demands of Industrial Newark, Westinghouse Electric Supply Co., distributor of Westinghouse products for the state of New Jersey, recently moved into larger quarters in a four-story building at Green St. and McCarter Highway. The firm recently was host to 500 Westinghouse dealers at a buffet supper and inspection tour of the new building.

Welcoming the dealers were H. B. Tompkins, manager of the eastern district, and L. P. Philip, manager of the New Jersey division of the Supply Co.

Built by the Kasbro Construction Co. of this city, the new building is of brick, concrete, and steel construction, and is fireproofed throughout. The first floor will house a display of Westinghouse appliances, lighting equipment, Mazda lamps, and electrical supplies.

Feature of the first floor display is the all-electric kitchen equipped with an electric dishwasher, range, clock, refrigerator, and water heater. This display, according to officials of the distributorship, will be available for the use of dealers and builders with clients who contemplate installing all-electric kitchens.

Second floor of the new building houses the Newark branch offices. Remainder of the building, which totals 36,000 sq. ft. of floor space, provides warehouse and distribution facilities. A complete line of Westinghouse appliances will be carried in stock.

Mr. Philip has been identified with the electrical business in Newark since 1932. He was first with the Regina Corp. at Rahway, and later headed the Electric Equipment Corp. of this city, distributor of Westinghouse refrigerators in northern New Jersey.

Heading up branch office activities is R. E. Buxton, of Montclair, merchandise sales manager. Al Reilly of Newark is manager of apparatus supplies and lighting sales, Carl Sandberg is manager of lamp sales, and S. N. Hauser of Bloomfield is in charge of lighting equipment sales. W. L. Nisbet is manager of the Trenton branch office.

New York, Detroit Agencies Complete Merger

NEW YORK CITY—Dorrance, Sullivan & Co., Inc., New York City advertising agency, and the eastern division of Brooke, Smith & French, Inc., Detroit, have been joined in a corporation in New York to be known as Brooke, Smith, French & Dorrance, Inc.

Brooke, Smith & French, Detroit, however, retains its identity in that city, and will continue to handle accounts in the middle west with no change of personnel or corporate title. The merger allows for an exchange of services by both agencies, the Detroit agency gaining an enlarged New York City office and its trained personnel.

Offices will be continued in both cities. The New York City office is located at 347 Madison Ave., and the Detroit office at 82 East Hancock Ave.

Officers of the New York agency are Guy C. Smith, chairman of the board, and Sturges Dorrance, president. Willard S. French is executive vice president; H. H. Olmacher is secretary; and Charles W. Brooke, treasurer. Shaw Newton, formerly with Brooke, Smith & French in New York City, has been made a vice president of the merged agencies. H. M. Overstreet and Henry E. Pangel, Jr., both formerly with Dorrance, Sullivan & Co., are also made vice presidents.

You are ON the threshold...

WHY NOT STEP INSIDE?

Easy to install. No pipes. No ducts to build. No water connections. That's how simple it is to install the Fairbanks-Morse Ortho-Clime Unit Room Air Conditioner

IF YOU are in the refrigerator business now, you are on the threshold of the air conditioning business. Why not step inside? Many of the contacts you have already established in the refrigeration business are natural prospects for air conditioning. Someone in your community is going to sell them . . . and profit handsomely. Don't let someone else reap the profits from your prospect list. Enter the air conditioning field now.

With the Fairbanks-Morse Ortho-Clime Unit Room Air Conditioner, no increase in your selling expense is necessary. You need no engineering staff. Anyone who can install an electric refrigerator can install this Unit Room Air Conditioner. Simply back it up to a window . . . attach to the electric circuit . . . snap the switch. That's all there is to the installation "job."

Complete—Compact Efficient

The entire mechanism of the Fairbanks-Morse Ortho-Clime Unit Room Air Conditioner is enclosed in a handsome cabinet so skillfully executed that it lends atmosphere to any surroundings. Finished in American walnut, hand-rubbed.

It measures 41" high; 41½" wide; 18½" deep. Its capacity is 10,000 B.T.U.'s per hour—a cooling effect equivalent to 1665 pounds of ice per day. That's more comfort per dollar than other similar units. In operation it makes less noise than an ordinary exhaust

fan. It cools, filters, humidifies, and circulates air—complete summer air conditioning for offices, hotel rooms, homes, and many types of shops (such as furriers', etc.).

The Ideal Franchise

Fairbanks-Morse Ortho-Clime offers you the ideal air conditioning franchise. You have back of you a company which for more than a century has been successfully engaged in adapting scientific principles to practical application. You are selling a product in which the buyer has confidence—because Fairbanks-Morse builds it! Inquiries from responsible organizations with adequate distributing facilities are invited. Address Fairbanks, Morse & Co., Dept. 2831, 900 S. Wabash Avenue, Chicago, Ill.

F-M Ortho-Clime Central Station Units

The Ortho-Clime line is complete. It includes central station units for every size and type of requirement—each engineered for its specific job. These units give complete year-round air conditioning—cooling and dehumidifying in summer. Heating and humidifying in winter. Circulating and cleansing in all seasons.

FAIRBANKS-MORSE
ORTHO-CLIME
AIR CONDITIONING EQUIPMENT



Utility-Sponsored Educational Campaigns For Appliance Dealers Urged by Greusel

MADISON, Wis.—Cooperation between public utilities and appliance dealers was the merchandising theme advocated by Frank W. Greusel, president of the Wisconsin Radio, Refrigeration & Appliance Association, in his recent address before the load building program conference of Wisconsin Light & Power Co.

"I suggest to utility representatives," said Mr. Greusel, "that they take the lead in building up among the dealers in each town a feeling of confidence, born of acquaintance and associations, to the point where the dealer will visit utility representatives for counsel and advice on daily problems."

"Utilities are agreed that education is needed to aid dealers in the contact of their affairs. A single failure within the electrical industry is a blot on our record. I think that an organized effort on the part of utilities toward frequent educational campaigns on the cost of doing business, with a few doses of salesmanship injected along the way, would be well received by the many dealers needing this very treatment. I know of no other single or group interest as able to assume this task as the utility."

MERCHANDISING A SIDELINE

"In the cities served by the Wisconsin Power & Light Co., there are relatively few specialty appliance dealers retailing home appliances exclusively. Generally speaking, the merchandising of both large and small appliances is combined with electrical contracting, plumbing, heating, hardware, furniture, or department stores."

"Such a situation results either in the establishment of a separate appliance department, with the overhead expense incidental to such a method, or it results in the proprietor attempting to extend his knowledge to cover all the products which he offers for sale."

BOTH HAVE WEAK POINTS

"Both methods have their weak points. The store with the separate department faces a definite problem in securing sufficient volume at proper profit to justify the additional expense. Where electrical home appliances are just 'another line of merchandise' the merchant sometimes lacks the ability to present major items intelligently enough to compete successfully, not in price, but in product knowledge, against more experienced or capable sales people."

"Lack of sales training and too limited knowledge of the product is the greatest problem confronting the entire appliance industry today, and is receiving attention not only from utilities but also from manufacturers and wholesale distributors as well. Progress is being made slowly. Merchants must be made to realize that product knowledge and keen sales ability are absolutely necessary in the conduct of successful business today."

"The wide difference of operating methods combined with the keen and sometimes destructive competition existing between dealers often makes it difficult for the commercial manager of a utility to properly determine the correct approach to cooperative methods."

DEALER BIGGEST PROBLEM

"The average dealer probably presents the biggest problem. He feels he lacks the tools which the larger department stores, the national chain stores, and the utilities possess."

"In most instances he has sprung from the ranks of mechanics and service men and learns his lessons only by hard knocks and thrift. During the early stages of his career he may learn a few business principles, but only at terrific cost."

"He usually loses sight of the irreducible items of overhead expenses, and feels satisfied with an income about the same as he enjoyed while in another's employ."

"It is at this crucial time that manufacturers' representatives, distributors' salesmen, and utility employees can contribute much to such a beginner by educating him in the proper conduct of his business. Dun & Bradstreet tell us daily of failures occasioned by lack of experience and lack of capital. These two causes of dealer mortality are responsible for 80% of this class of failure."

To support his contention that the dealer requires assistance in this pro-

blem, Mr. Greusel cited a recent contest sponsored in Milwaukee by an anonymous radio distributor.

The contest offered weekly cash prizes to retail radio salesmen who displayed the best knowledge of their merchandise. Reports of professional shoppers who made the survey showed that 80% of the sales people failed in varying degrees from "poor to terrible." Lack of knowledge, lack of personality and indifference played a large part in this heavy percentage.

BEST SHOWING

"So-called specialty radio and appliance dealers," Mr. Greusel stated, "made the best showing, but only in such cases where the proprietor worked as his own salesman, or where the salesman had been trained by this sort of tutor."

"The poorest showing was made by this same type of dealer where the element of personal supervision or leadership was lacking. The ex-

periment found the hardware dealer a very poor radio merchant. The furniture store rated even worse. The department store was merely average."

"The most interesting fact was the evidence of improvement made weekly by many of the retailers and their salesmen, and the willingness of the salesmen to accept aid."

Mr. Greusel also explained the value of budgets, pointing out their use by department stores, national chain stores, and utilities.

Mr. Greusel even went so far as to suggest to merchants operating in towns that can afford it, a plan of proper bookkeeping to be kept current by a competent, confidential accountant willing to serve several dealers in the same line of business.

Collective advertising is another cooperative activity which Mr. Greusel advocates. Such a policy, he maintains, is economically sound for the entire trade.

"Group activity is also very beneficial," continued Mr. Greusel. "By this I do not necessarily mean a completely organized association which usually has price control as its first objective. Such organizations rarely function beneficially."

"By group activity I mean the formation of all members of the trade in some organized manner that will permit of frequent meetings. Of course, some definite program or objective would be desirable, but if you can't build such a program, justify a regular scheduled meeting some way, even if you have nothing more than a pony of beer with pretzels as the attraction."

Mr. Greusel summarized his recommendations for utility-sponsored educational programs as follows:

"Continue as frequently as possible a sales training course in your several districts."

"Encourage your own trained sales people to enter the employ of dealers, at least in the larger cities of your territory. These people will improve, in many instances, the caliber of dealer organization, and establish a more understanding relationship between dealer and utility."

"Have your financial or accounting department cooperate with your commercial department in offering to your dealers training courses covering cost accounting, collection methods, credit control, and kindred financial problems."

Utility Promotes Sale Of Appliances with '10-for-1' Rate

MILWAUKEE — Providing potent stimulation to dealer and distributor sales of electrical appliances, the Milwaukee Electric Railway & Light Co. is using an extensive newspaper campaign to announce the extension for one year of the "10-for-1 bargain rate" electricity plan instigated by the company in October, 1935.

The plan, according to F. A. Coffin, sales manager, allows residence, rural, and commercial lighting customers to double their last year's use of electric service for only 10% more a month than they paid in each corresponding month last year. If current consumption exceeds twice the amount of that used last year, the customer pays two cents per kwh. on the additional current used.

Advertising used by the utility to announce the extension includes full page insertions in Milwaukee metropolitan newspapers, and 13-inch insertions in suburban and rural papers.

Largely as a result of this plan, Mr. Coffin states, Milwaukee residents used 40 million more kwh's in 1936.

Grunow.

(JUNE TO JANUARY)

2 BIG SELLING SEASONS - 2 BIG LINES



THE MARION, INDIANA PLANT
Here Grunow Radios are manufactured completely to Grunow super-standards of accuracy giving employment to hundreds of Hoosier craftsmen.



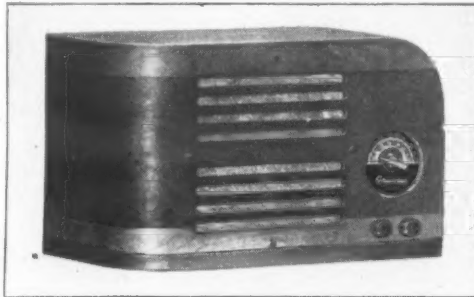
THE GEORGE ST. PLANT, CHICAGO
One of the Chicago plants where Grunow refrigerators are manufactured.



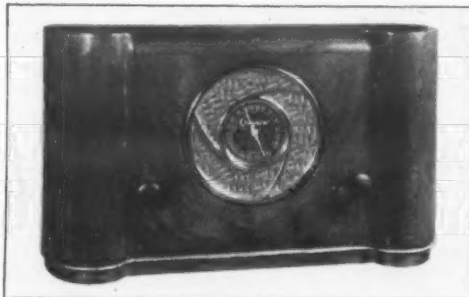
THE PULASKI ROAD PLANT, CHICAGO
In this great plant, Grunow refrigerators are completely manufactured. Also houses the engineering and experimental laboratory and the executive offices of General Household Utilities Company.

Here are the NEW 1937 GRUNOW RADIOS WITH TELEDIAL!

"Tops" in Automatic Tuning!



No. 566 . . . the popular low priced GRUNOW that builds volume and prospect lists. A standout in the line.



No. 590 AC-DC just introduced . . . and already a favorite with dealers all over the country.



No. 654 . . . a newcomer to the GRUNOW line . . . medium priced table model with foreign reception. Will be a business getter.



No. 755 . . . A luxurious console model . . . Foreign receiver . . . GRUNOW's new bid for the "in-between" priced market.



No. 1191 . . . the well known 3 band GRUNOW "Eleven" console. The biggest seller in the line since its introduction.



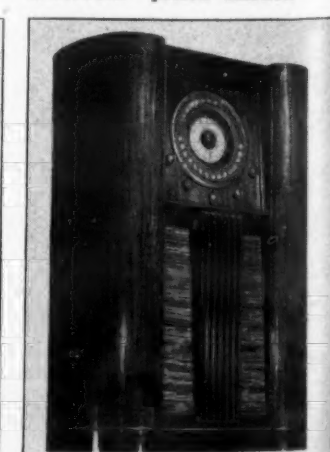
No. 1193 . . . a brand new cabinet with the proved "Eleven" chassis. Already sales show this handsome GRUNOW console is a winner.



No. 1291 . . . This handsome TELEDIAL "12" has real automatic tuning . . . works exactly like a dial telephone. Marvelous floor traffic builder.



No. 1297 . . . Another TELEDIAL "12" in super-deluxe matched walnut, violin-shaped cabinet at a remarkably low price.



No. 1541 . . . A 15-tube 4 band TELEDIAL with 3 speakers, in handsome matched walnut violin-shaped cabinet.

GRUNOW ALSO MANUFACTURES BATTERY FARM RADIOS . . . and "TELEDIAL" AUTOMOBILE SETS

Norge Sales Total 43,065 Units In January, Increase of 47%

DETROIT, Feb. 2—January Norge sales covering all products totaled 43,065 units, a 47.6% increase compared with the like month of 1936, Howard E. Blood, president, Norge division, Borg-Warner Corp., stated today.

The January sales increase by products, compared with the similar month last year, were: refrigerators, 75.9%; washers, 37.8%; ironers, 173.5%; commercial refrigeration units, 107.6%; kitchen ranges, 21.9%; oil burners, 121%; furnaces, 361.5%.

Grand Rapids Utility Gives Bonuses To Customers

GRAND RAPIDS, Mich.—Customers' bonus checks equal to 5% of purchase price plus 5% net cost of a Servel Electrolux G-500 model have been personally delivered by Grand Rapids Gas Light Co. to all users of gas house-heating units as a stimulus to Electrolux sales.

Amount of the bonus checks varies from about \$16 to \$30.

Electrolux Dealer Personally Sells 90% of Total

LOS ANGELES—C. Sumida, Japanese Electrolux dealer in this territory, was personally responsible for about 90% of the 150 sales reported by his dealership last year.

Cooperating with Southern California Gas Co., Mr. Sumida last spring won one of the dealer prizes offered by the utility in its leadership campaign.

Mr. Sumida makes almost all of his sales to Japanese residents in this locality. He is assisted by two college students who work on a part time basis.

Rackliffe Bros. Holds 3 Day 1937 Kelvinators Preview

NEW BRITAIN, Conn.—First showing of 1937 Kelvinator products in this territory is being conducted during the first three days of this week by Rackliffe Bros. Co., Inc., distributor for Connecticut and western Massachusetts.

Sales and merchandising plans are also being outlined by Fred O. Rackliffe, head of the company, and M. L. Hagle, sales manager.

Reports Monthly Current Bill Of \$5.95 for Kelvin Home

BIRMINGHAM, Ala.—A 100% electrified home, including air conditioning, in which an actual monthly bill (the first one) ran only \$5.95, is reported by Barney DeRamus, residential sales manager of the Birmingham Electric Co. The home is his own, one of several Kelvin Homes built throughout the country for demonstration purposes.

The bill was for the consumption of 210 kwh., and included the normal operation of many electrical appliances and heating equipment.

Apex Holds Conference of Eastern Sales Force

NEW YORK CITY—Wholesale representatives and distributors of the Apex Electrical Mfg. Co. in the eastern sales territory attended a one-day sales convention here recently.

Movies and skits, depicting the right and wrong way of selling, were followed by a complete presentation of the Apex 1937 sales promotional program, conducted by factory representatives and zone managers.

First Kelvinator Advertising To Appear In Post, Collier's

DETROIT—First advertisement in Kelvinator's 1937 electric refrigeration and home appliances campaign will appear Feb. 20 in *Saturday Evening Post* and *Collier's*. Printed on reverse plates, the advertisement will occupy three successive right-hand pages in the magazines.

Copy on the first page will feature the Kelvin home, the second page will describe briefly the company's home appliances, and the third page will be devoted exclusively to the refrigerator. Also featured will be a consumer contest, with Nash cars and completely equipped Kelvin homes as prizes.

Ice Box Sales Total 108,783 For Last 5 Months in 1936

CHICAGO—Sales of ice refrigerators during the last five months of 1936 totaled 108,783, an increase of 22% over the 89,148 units sold during the same period of 1935, according to figures announced by E. G. Vail, secretary of the National Association of Ice Refrigerator Manufacturers.

Unfilled orders, at the close of the calendar year, were 67,963, against 44,770 at the same period in 1935, an increase of more than 50%.

H. D. Gibson Heads New Kelvinator Selling Division

DETROIT—To aid distributors and the Kelvinator field organization in securing and developing key accounts in important trade centers, Kelvinator Division, Nash-Kelvinator Corp. has formed a new merchandising division headed by H. D. Gibson.

Work of the new department will center on contacting major department stores, furniture stores, and large specialty dealers, according to M. S. Bandoli, Kelvinator's domestic refrigeration sales manager.

Five regional merchandise managers will work under Mr. Gibson in the new merchandising department. J. M. Dierkes and J. J. O'Neil have been assigned to the Eastern region; W. S. Reinhart and D. A. Coleman will operate in the North Central region; and J. H. Wimberly will work in the South Central area.

Mr. Gibson comes to his new position at Kelvinator Corp. with 15 years experience in the electrical appliance merchandising field, and has been associated with the electric refrigeration field for the past three and a half years. He began his business career as a student in the Westinghouse Electric & Mfg. Co. in 1920.

Vitreous Enamelers To Be Guests At P. E. I. Meeting

CHICAGO—That members of the Institute of Vitreous Enamelers of England will be special guests of the Porcelain Enamel Institute at its seventh annual meeting in October was announced following the Porcelain Enamel Institute executive committee meeting in Cleveland, Jan. 27.

Chicago was selected as the place for the annual meeting this year. Tentative dates of Oct. 12-13 were set. The hotel will be selected later.

"Members of the Institute of Vitreous Enamelers, who have an association in England similar to our own Porcelain Enamel Institute, have been contemplating a trip to the United States for some time," Robert G. Calton of the Tennessee Enamel Mfg. Co., institute president said, "our office is cooperating in arranging an itinerary of enameling plants for the English enamelers, and we shall see to it that they have a most profitable visit."

Other important institute projects discussed and approved by the executive committee were: renewal of research fellowship at Ohio State University, "Porcelain Enamel Week," architectural research, the creation of an associate membership, the research and market development activities of the Educational Bureau, and the "Porcelain Enamel Institute Forum." The fellowship at Ohio State University, which was awarded last year to Dr. George T. Rankin, will continue for another year as a result of a donation for this purpose from the Chicago Vitreous Enamel Product Co. of Cicero, Ill.

Prof. R. M. King, technical adviser to the institute, reported that Dr. Rankin's research is progressing along highly constructive lines and that, when completed, will produce a development of value to all firms manufacturing porcelain enamel and porcelain enameled products. The first year of the research fellowship, which has just ended, was financed by a donation from a friend of the Ferro Enamel Corp. at Cleveland.

Plans for a nation-wide "Porcelain Enamel Week," which will be observed by all companies manufacturing porcelain enamel or porcelain enameled products, were discussed by the committee, and the tentative plan was approved. The week following the annual meeting was tentatively designated as the time for observance of this special week, however, no definite date will be set until institute headquarters completes its survey among cooperating manufacturers, advertisers, and retail outlets to determine the most effective date. Preliminary plans call for a nation-wide publicity campaign, local publicity in cities where enameling plants are located, and the cooperation of national advertisers of porcelain enameled products.

One of the primary problems of the institute since its organization has been to obtain the active cooperation of manufacturers of finished porcelain enameled products, it was pointed out at the meeting. In an attempt to bring these firms into closer relationship with the rest of the industry, the executive committee authorized the establishment of an associate membership.

The fee for this membership will be \$50 a year and will be available to manufacturers of refrigerators, washing machines, stoves and ranges, and all other forms of porcelain products.

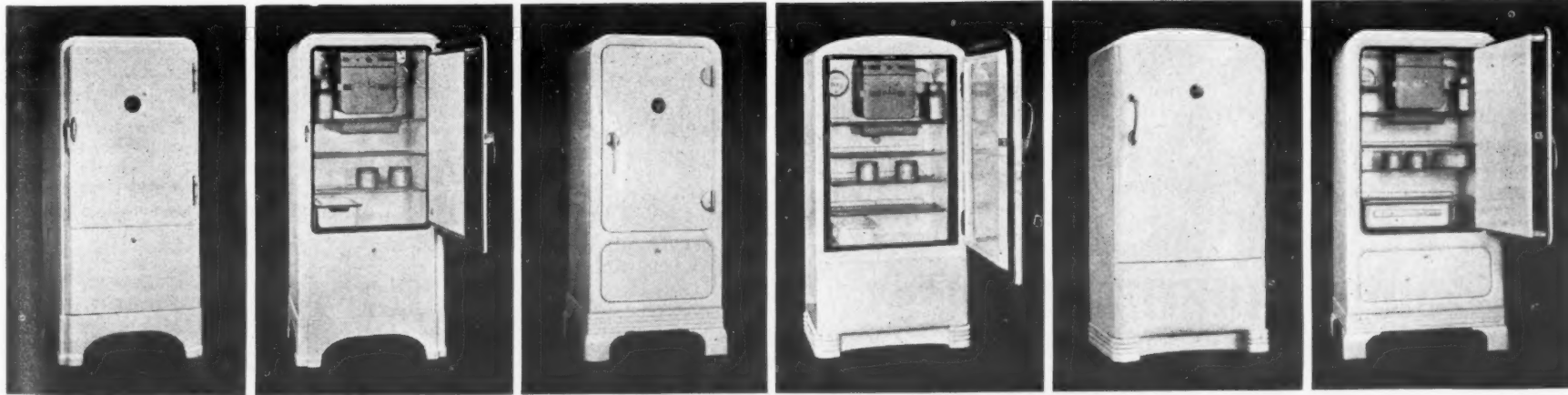
ALL the Year!

(JANUARY TO JUNE)

THAT REFLECT QUALITY ON EACH OTHER!

The Great Big Beautiful NEW GRUNOW REFRIGERATORS For 1937!

(AIR-CONDITIONED REFRIGERATION FOR EVERYONE)



No. 53W . . . with the GRUNOW "Aerator" and standard accessory group.

No. 63W . . . with the GRUNOW "Aerator" and standard accessory group.

No. 58WD . . . has the GRUNOW "Aerator" and standard accessory group. Flush type doors.

No. 68WD . . . with GRUNOW "Aerator", standard accessory group, cabinet designed by WALKER.

No. 68WSD . . . with GRUNOW "Aerator", Deluxe accessory group, cabinet designed by WALKER.

No. 83WSD . . . with GRUNOW "Aerator", Deluxe accessory group and flush type doors.

LOOK FOR THE NAME OF YOUR NEAREST DISTRIBUTOR *

AKRON, OHIO, M & M Company	Rf & R	DALLAS, TEXAS, Peaslee-Gaulbert Corp.	R	LITTLE ROCK, ARK., 555 Inc.	R	PITTSBURGH, PA., Joe Miller c/o	Rf & R
ALBANY, NEW YORK, Ignition Service & Supply Company	Rf & R	DAVENPORT, IOWA, Midwest Timmermann Co.	Rf & R	LOS ANGELES, CALIF., Watson & Wilson, Inc.	Rf & R	White Terminal	Rf & R
ALTOONA, Pa., Electric Appliance Dist.	Rf & R	DAYTON, OHIO, Griffith Distributing Corp.	Rf & R	LOUISVILLE, KY., Peaslee-Gaulbert Corp.	Rf & R	PORTLAND, ME., Portland Dist. Co.	Rf & R
ATLANTA, Ga., Peaslee-Gaulbert Corp.	Rf & R	DENVER, COLO., Whitney Sporting Goods Co.	Rf & R	MEMPHIS, TENN., Riechman Crosby Co.	Rf & R	PORTLAND, ORE., F. B. Connelly Co.	Rf & R
BALTIMORE, MD., People's Electrical Supply Co., Inc.	Rf & R	DES MOINES, IOWA, H. E. Sorenson Co.	Rf & R	MEXICO CITY, MEXICO, Radios Y Refrigeradores	Rf & R	READING, PA., Bright & Co.	Rf & R
BENningTON, N. Y., Morris Distributing Co.	Rf & R	DETROIT, MICH., Specialties Dist. Corp.	Rf & R	MIAMI, FLA., Electrical Equipment Co.	Rf & R	ROCHESTER, N. Y., Kemp Equipment Co.	Rf & R
BIRMINGHAM, ALA., E. E. Forbes & Sons	Rf & R	DOUGLAS, ARIZ., Car Parts Depot, Inc.	Rf & R	MILWAUKEE, WIS., Lappin Electric Co.	Rf & R	SAGINAW, MICH., J. Geo. Fischer & Sons	Rf & R
BLUEFIELD, W. VA., Flat Top Supply Co.	Rf & R	DUBUQUE, IOWA, Midwest Timmermann Co.	Rf & R	NASHVILLE, TENN., Nashville Chair Co.	Rf & R	SALT LAKE CITY, UTAH, Radio Studios, Inc.	R
BOISE, IDAHO, Oakley Electric Co.	Rf & R	EL PASO, TEXAS, Car Parts Depot, Inc.	Rf & R	NEWARK, N. J., Nassau Distributing Co.	Rf & R	SAN ANTONIO, TEXAS, Peaslee-Gaulbert Corp.	R
BOSTON, MASS., J. H. Burke Co.	R	FT. WORTH, TEXAS, T. C. Jones Co.	Rf & R	NEW ORLEANS, LA., C. T. Patterson Co., Inc.	R	SAN FRANCISCO, CALIF., The Geo. H. Eberhard Co.	Rf & R
BROOKLYN, N. Y., E. A. Wildermuth Co.	R	GRAND RAPIDS, MICH., Republic Dist. Co., Inc.	Rf & R	NEW YORK CITY, N. Y., Grunow Refrigerator Service, Inc.	Rf & R	SEATTLE, WASH., F. B. Connelly Co.	Rf & R
BUFFALO, N. Y., C. Kurtzmann & Co.	Rf & R	GREENSBORO, N. C., Piedmont Dist., Inc.	Rf	NORTH PLATTE, NEBR., Kunkel Auto Supply Co.	Rf & R	SOUTH BEND, IND., The Ridge Co.	Rf & R
CHARLESTON, W. VA., Williams Dist. Co.	R	HARRISBURG, PA., Motor Parts Co.	Rf & R	OKLAHOMA CITY, OKLA., Hughes-Bozarth-Anderson Company	Rf & R	SPOKANE, WASH., F. B. Connelly Co.	Rf & R
CHICAGO, ILL., Harry Alter Co.	Rf & R	HARTFORD, CONN., Stern & Co., Inc.	Rf & R	OMAHA, NEBR., Graybar Electric Co.	Rf & R	ST. LOUIS, MO., Brown Supply Co.	Rf & R
CINCINNATI, OHIO, Griffith Distributing Corp.	Rf & R	HAVANA, CUBA, Giralt, S. A.	Rf & R	PADUCAH, KY., The Ferguson Co.	Rf & R	TOLEDO, OHIO, H. Poll Electric Co.	Rf & R
CLEVELAND, OHIO, M & M Company	Rf & R	HOUSTON, TEXAS, Peaslee-Gaulbert Corp.	R	PETERSBURG, VA., Virginia Battery & Ignition, Inc.	Rf & R	UTICA, N. Y., Horrocks Ibbotson Co.	Rf & R
CLARKSBURG, W. VA., Williams Dist. Co.	R	INDIANAPOLIS, IND., Griffith Distributing Corp.	Rf & R	PHILADELPHIA, PA., Motor Parts Co.	Rf & R	WASHINGTON, D. C., Shapiro Dist., Inc.	Rf & R
COLUMBUS, OHIO, M & M Company	Rf & R	JACKSONVILLE, FLA., Glover Weiss Co.	Rf	PHOENIX, ARIZ., Arizona Hardware Supply	Rf	WICHITA, KANS., Southwest Dist.	Rf & R
COLUMBIA, S. C., R. E. Mehlman, Inc.	Rf & R	KANSAS CITY, MO., Graybar Electric Co.	R			WINSTON-SALEM, N. C., Brown-Rogers-Dixon Co.	R
		McNeil & Likens, Inc.	Rf			YOUNGSTOWN, O., M & M Company	Rf & R

"TELE-DIAL"



GENERAL HOUSEHOLD UTILITIES COMPANY

CHICAGO, ILLINOIS

*R (Radio only). RF (Refrigerator only). RF & R (Both Refrigerators & Radios).

"CARBENE" Demonstrator



CIT's 1936 Earnings Total \$21,181,020

NEW YORK CITY—Commercial Investment Trust Corp.'s annual report to stockholders shows net profits of \$21,181,020 for 1936, compared with \$15,867,591 for the previous year. Earnings for the year include those of National Surety Corp., an unconsolidated subsidiary.

Total volume of receivables purchased was \$1,169,696,815—an increase of 21%. Volume of installment receivables showed an increase of 48%.

After dividends on preferred stock, there remained net earnings of \$20,083,159, equal to \$6.07 per share on 3,307,422 shares outstanding as of Dec. 31, 1936. Non-recurrent dividends paid on preferred stocks converted or retired during the year were equal to 21 cents per share on common stock.

Cash dividends declared on common stocks in 1936 amounted to \$14,890,622, as compared with \$7,296,217 in 1935. Present regular dividend rate on the common stock is \$4 per share.

Total outstanding receivables were \$397,657,763, compared with \$256,498,263 at the previous year end, an increase of 55%. Capital and surplus amounted to \$112,193,686.

Parker Rust-Proof Pays \$2.51 Stock Dividend

DETROIT—Net earnings of Parker Rust-Proof Co. for 1936, after full provision for Federal taxes of \$182,085, amounted to \$1,082,146.48, or \$2.51 a share on the 429,498 shares of common stock outstanding.

The number of Parker's licensed customers increased 19.5% over the 1935 total with a resultant increase in tonnage of chemical sales. New customers included a number of nationally known manufacturers of iron and steel building products, electrical devices, and office and industrial equipment.

Manufacturers of air-conditioning equipment, gasoline pumps, cream separators, time recorders, and steel cabinets were also among those purchasing Parker rustproofers for the first time. The refrigeration and automotive industries have long been quantity users of Parker products.

During 1936, Parker research efforts produced new processes which render zinc and cadmium coated surfaces more suitable for paint, and which give the smaller user of Parker rust-proofing materials greater efficiency and economy of application.

All-Electric Kitchen Is Completed before Power Is Available

BRADLEY, Ga.—Mrs. A. B. Winters, wife of the local postmaster, transformed her back porch into an electrically-equipped kitchen, complete with refrigerator, range, and water heater—and then had to wait two weeks until the power line reached the town.

For years, Mrs. Winters had been planning for the day when electricity should come to Bradley. Finally, when it was decided to cut the town in on the Georgia Power Co.'s line, Mrs. Winters changed her planning into activity.

She walled in the back porch of her home, installed doors and windows, and then furnished this new addition with electric appliances. She completed her work and had her kitchen ready to use fully two weeks before electric current was available.

The electric range was placed beneath a window, the refrigerator was conveniently located near the breakfast table, cabinet, and dining room, and the water heater stood against the wall which separates the kitchen from the bathroom. This latter arrangement eliminated any need for additional piping.

Electric equipment has not been confined to the house, for an electric water pump also has been installed.

More than pleased with the results of her modernization, Mrs. Winters reports a monthly saving of \$14 in her household expenses since the introduction of electricity. Previously she had spent about \$22 monthly for kerosene, gasoline, oil, ice, coal, and wood. Now her total monthly electric bill averages only \$8, despite the fact that current is used not only for the range, refrigerator, water heater, and water pump, but also for a clock, iron, mixer, fan, radio, and lighting.

New Appliance Dealership Opens In Baltimore

BALTIMORE—Metropolitan Radio & Refrigeration Co., retailer of refrigerators, radios, and other appliances, has opened for business at 3607 Easter Ave., here. Joe Brown, formerly in charge of refrigeration and radio activities at S. Kann's department store, Washington, D. C., heads the new concern.

Missouri, Illinois Men View New F-M Line

ST. LOUIS—The 1937 Fairbanks-Morse line of Conservador electric refrigerators was shown to approximately 125 dealers and salesmen in the Missouri and Illinois territory at a one-day meeting Jan. 26 in Hotel Statler.

H. L. Hilleary, manager of the St. Louis branch of Fairbanks, Morse & Co., was in charge of the meeting. Formal presentation of new models was made by W. Paul Jones, general manager of the company's home appliance division.

The short morning session, in which the 1937 line was introduced, was followed by an afternoon devoted to the outlining and discussion of merchandising and advertising plans for the year.

Present at the meeting, in addition to Mr. Jones and Mr. Hilleary, were the following members of the St. Louis branch sales personnel:

Russ Lewis, dealer sales manager; Paul Cain, sales promotion manager; Richard Deck, assistant sales promotion manager; Tom Baker, Pat Klumbers, Dick Matthews, Ed Rauschkolb, Ed Fletcher, and Ivan Gettle of the dealer sales department; George Noser, service manager; and George Luebbers, credit department.

Mrs. Schwin to Direct Hotpoint Division

CHICAGO—New director of Edison General Electric Appliance Co.'s home economics department is Mrs. Mary Lowell Schwin, who was recently appointed to the position by R. W. Turnbull, vice president and general sales manager of the company. Graduated from Simmons College, Boston, in 1928, with a Bachelor of Science degree, Mrs. Schwin took her Master's degree at the University of Colorado in 1929. She joined the home economics staff of Edison General Electric Appliance Co. in 1930, and later was selected to fill the position of assistant director.

While employed in this capacity, Mrs. Schwin visited more than 40 states, conducting home service conferences, electric cookery demonstrations for utility companies, and co-operating with newspapers in staging cooking schools.

In her new position, Mrs. Schwin will direct the activities of the entire staff of field home economists for the complete Hotpoint line.

Main Store of Robischung-Kiesling, Houston, Tex.



Ultra-modern central office and demonstration floor of an enterprising Frigidaire dealership which sold \$140,000 worth of household refrigerators last year. Robischung-Kiesling operates four other stores in Houston.

- PROFITABLE SALES METHODS -

Inter-Company Competition Between Five Robischung-Kiesling Stores Produces \$140,000 in 1936 Household Sales

HOUSTON, Tex.—Controlled or co-operative inter-company competition is credited by Robischung-Kiesling, Inc., as the chief profit builder of an appliance business which sold more than \$140,000 worth of household electric refrigerators alone during the first eight months of 1936.

The firm operates a central store at 4848 Main St., and four branch stores in the city. In addition to handling the Frigidaire line, the company sells laundry equipment, room coolers, attic ventilating systems, and other appliances.

"With five stores, we have five sales organizations fighting for the business. Each store is just as competitive with the other stores as with any firm outside of our organization," states J. A. Kiesling, president.

NO CLOSED TERRITORIES

Any salesman at any store can work anywhere in Houston; there are no closed sales territories, Mr. Kiesling explains. Nor is there protection between stores, he adds—one prospect name may be filed at all five locations.

"Each store, however, does protect its own salesmen on prospects that they have indexed, so that no other man in the branch can work on another's sale," he states.

"By having competition within our own organization, we keep each staff alert. Chief advantages of the system," Mr. Kiesling adds, "are that we have joint meetings and exchange information, and all five organizations profit from each other's experience."

All Robischung-Kiesling, Inc., stores are under one sales manager, Claude J. Corey, secretary-treasurer of the company.

STORES HIRE OWN HELP

"Each store manager hires and fires his personnel, and trains his own men," the company president states. "We have joint training schools to supplement the work done by each store manager. By having the sales organization broken up into five divisions, each salesman's work is closely supervised."

Another advantage obtained by having separate sales divisions, Mr. Kiesling believes, is that each salesman has a chance to use the showroom for closing sales.

"It is easy for the salesman to establish contacts, and to get into the prospect's home. But he seldom makes a sale until he gets the prospect into the showroom," he declares. "One of the best plans we have used to get prospects to the showroom is giving premium checks."

"Each of our stores has had checks printed for its salesmen to give those prospects a little gift who agree to come to the showroom at a specific time. The checks are filled in to specify the designated time at which the housewife will be at the store."

The prospect is not required to make any purchase when she calls to accept her premium. Inexpensive articles such as cake plates are given.

NO EXPENSIVE PREMIUMS

"We are opposed to the use of expensive premiums that are nothing short of a price reduction or an extra inducement to close a sale, but we have found that giving a conservative little gift is an effective and profitable plan to get prospects into the store," says Mr. Kiesling. Salesmen and the firm share the cost of the premiums.

The salesmen close approximately 85% of the prospects who come to the showroom on a definite appointment, according to Mr. Kiesling.

"Often when the prospect does not buy the refrigerator which she came to see," he adds, "she may buy an ironer, a washer, or some other major appliance."

The firm requires its salesmen to call back three times within 10 days after a major electric appliance has been sold, believing that more leads to new sales are obtained from users within the first 10 days than during any other time.

Call-back contracts are made to fully acquaint the user with the appliance, to distribute recipe books, or to make other service-type calls, on which the salesman may obtain new leads.

Founded in 1900 as a plumbing and heating concern, Robischung-Kiesling, Inc. has developed into one of the leading merchandisers of electric appliances in the state.

During 1937 the company plans to open three additional community branch stores in Houston, according to Mr. Kiesling.

The MOTOR
that Made
HISTORY~

LOWER STARTING CURRENT THAN ANY OTHER TYPE MOTOR

For more than 33 years Century Single-Phase, Brush-Lifting Motors have made history—eliminating the extra cost of over-motoring, because they have a lower starting current and a higher starting torque than any other type motor.

Long before Air Conditioning was even thought of as an industry, they established many outstanding performance records, driving Refrigerating Machines, Compressors, Pumps and all similar Air Conditioning equipment—in all kinds of service, in all climates, in all parts of the world.

They were more than adequate and ready for Freon Compressors long before Freon Gas was ready for refrigeration.

Find out about the low starting current and high starting torque advantages of Century Single Phase Brush Lifting Motors—they carry the load, economically!

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.

Offices and Stock Points in Principal Cities

Century
MOTORS



REPULSION START INDUCTION BRUSH LIFTING



"Refrigeration? You couldn't sell us anything BUT Copeland. My own experience has shown me which is the best."

Hotels, restaurants, soda fountains, dairies—wherever economical, trouble-free refrigeration is vital, you'll find Copeland enthusiasts.

Write for our Sales Plan

COPELAND

REFRIGERATION CORPORATION . . . DETROIT, MICHIGAN

Cohen Co. Gets Sioux City G-E Commercial Franchise

SIoux CITY, Iowa—N. Cohen & Co., which recently opened a new store at 810 Pierce St. here, has been named distributor of the General Electric commercial line. Mr. Cohen is handling commercial work, while C. P. Swan is general manager of the previously established home equipment department.

Toonder Named Assistant To Norge Sales Manager

DETROIT—C. L. Toonder, formerly in the air-conditioning sales and engineering department of Kelvinator Corp., has joined the commercial refrigeration and air-conditioning division of Norge as assistant to Sales Manager W. C. Rowles.

Mr. Toonder was with Kelvinator for four years, working with Matt Terry, John Wyllie, and J. K. Knighton in the development of the sales and engineering branches of the company's air-conditioning department.

Previously he had been with Carrier Corp. for four years in its New York City and Texas branch offices, and with Smith, Hinchman & Grylls, Detroit consulting architects.

Fogel Gets Installation Contract For 3,000 Stores

PHILADELPHIA — Frankford Grocery Co., operator of nearly 3,000 retail stores, has contracted for the installation of Fogel refrigeration equipment exclusively in its various branch establishments, according to Albert Fogel, sales manager of Fogel Refrigerator Co. here.

Completion of the arrangement between the refrigerator manufacturer and the grocery firm was announced at a banquet held here recently for 40 officials of the Frankford Co.

New Fogel distributors, recently appointed, included: Snell Engineering Corp., Miami, Fla.; Pittsburgh Case Sales Co., Pittsburgh; Leffler Bros., New York City; Display Case & Fixture Co., Washington, D. C.; and Jones Hardware Co., Shamokin, Pa.

— COMMERCIAL REFRIGERATION —

Hill Develops New Reach-In Box for Use in Hot Kitchen

(Concluded from Page 1, Column 2) Like the NEWS and do not mince words on subjects pertinent to the industry.

porcelain, the floor being welded to the walls, and the side walls to the back wall in the lower half of the refrigerator. Hard rubber door jams, stainless steel lower sills, chromium plated drain and bell trap, chromium plated brass hardware, and heavily tinned welded shelving are provided for added resistance against wear.

The coil chamber is especially designed to allow for more than the usual amount of coil surface, and the interior of the box is so constructed that food does not interfere with nor block free circulation of air, it is claimed.

For convenience, the coil is reached through an outside coil door and a hinged baffle, which permits adjustment of the expansion valve or inspection of the coils without difficulty. Interior of all models is illuminated, shelves are adjustable, and sectional construction permits knock-down of the box for export or passage through narrow doorways.

Lines of the refrigerator are compact and graceful, all corners are rounded, and no bolts or screws are exposed, except those used to attach the hardware.

Liquid Carbonic Builds Truck Refrigerating Unit Using Dry Ice

CHICAGO—A dry ice, thermostatically controlled refrigerating unit for trucks has been developed by Liquid Carbonic Corp. Under test conditions this unit has maintained substantial payloads of meat and fish at temperatures ranging from 27 to 45° F. during long trips, even though outside temperatures were sometimes over 100° F.

In this refrigerating unit, dry ice chills alcohol, which circulates on the thermo-siphon principle through a system containing a cooling surface similar to that of an automobile radiator. Air drawn from the upper part of the truck's interior is blown downward by small electric fans, through this cold radiator-like section onto the payload. The fans run constantly to insure proper temperature.

As the chilled alcohol is warmed by the air blown through the radiator, it automatically rises in the circulatory system, and is replaced by colder alcohol newly drawn from the bottom of the insulated dry ice compartment.

This process continues until the air temperature in the truck falls to the level at which the thermostat has been set. Then an automatic valve closes, and the alcohol ceases to circulate until the gradually rising temperature re-opens the valve. Since the dry-ice compartment is thoroughly insulated, it produces no cooling effect except through the radiator.

Overall measurements of the entire refrigerating unit are: length, 52½ inches; height, 24½ inches; width, 22½ inches. It is designed for mounting on angle-iron uprights at the forward end of the truck's interior, so as not to occupy space required for the payload.

Two sizes of this new unit are being made by Liquid Carbonic Corp. The larger size has a capacity of 200 lbs. of dry ice; capacity of the smaller model is 100 lbs.

'Veg-a-Krisp' Is Leader Of Quillen's Line of Display Cases

INDIANAPOLIS — Starring the "Veg-a-Krisp," a new idea in vegetable display cases, the 1937 line of Quillen commercial refrigerators has just been introduced by Quillen Bros. Refrigerator Co., 1639 Lafayette Rd.

The "Veg-a-Krisp" is a refrigerated cabinet designed to perform the dual function of presenting an eye-pleasing display of vegetables and keeping the latter fresh, cold, and crisp. All cabinets are 72 inches high and 30 inches deep, but there are two lengths available: one 6 feet 9 inches; the other, 12 feet.

Porcelain interior and exterior, 3-inch approved insulation, three shelves in the top compartment, and wire baskets for dry storage in the bottom are features of the "Veg-a-Krisp." There are six models of this new display cabinet with prices ranging from \$495 to \$1,193.

Model 6 XCV, equipped with coils, is listed at \$495. The next lowest in price is model 9 XCV, similarly equipped, listed at \$655. Priced at \$726 is model 6 XCMV, with coils, valve, and machine.

With the same equipment, model 9 XCMV costs \$898, and the next highest in price, but with coils only, is the \$917 model 12 XCV. Topping the price list at \$1,193 is model 12 XCMV, fully equipped.

The 1937 Quillen deluxe refrigerators for meats and dairy produce have 4-inch insulating board sealed with hydrolene, porcelain exterior, front, top, and ends, three-glass front and back, hard rubber service doors and frames, ball-bearing hardware, and stylish nameplate.

There are four sizes of cases, the 6, 8, 10, and 12-foot, and prices of cases along range from \$360 to \$736 in the top case style and from \$418 to \$826 in the double-duty style. The highest price of the entire line is the 12-foot double-duty unit, including case, machine, coils, valve, butcher pans, and trays, which is listed at \$1,266.

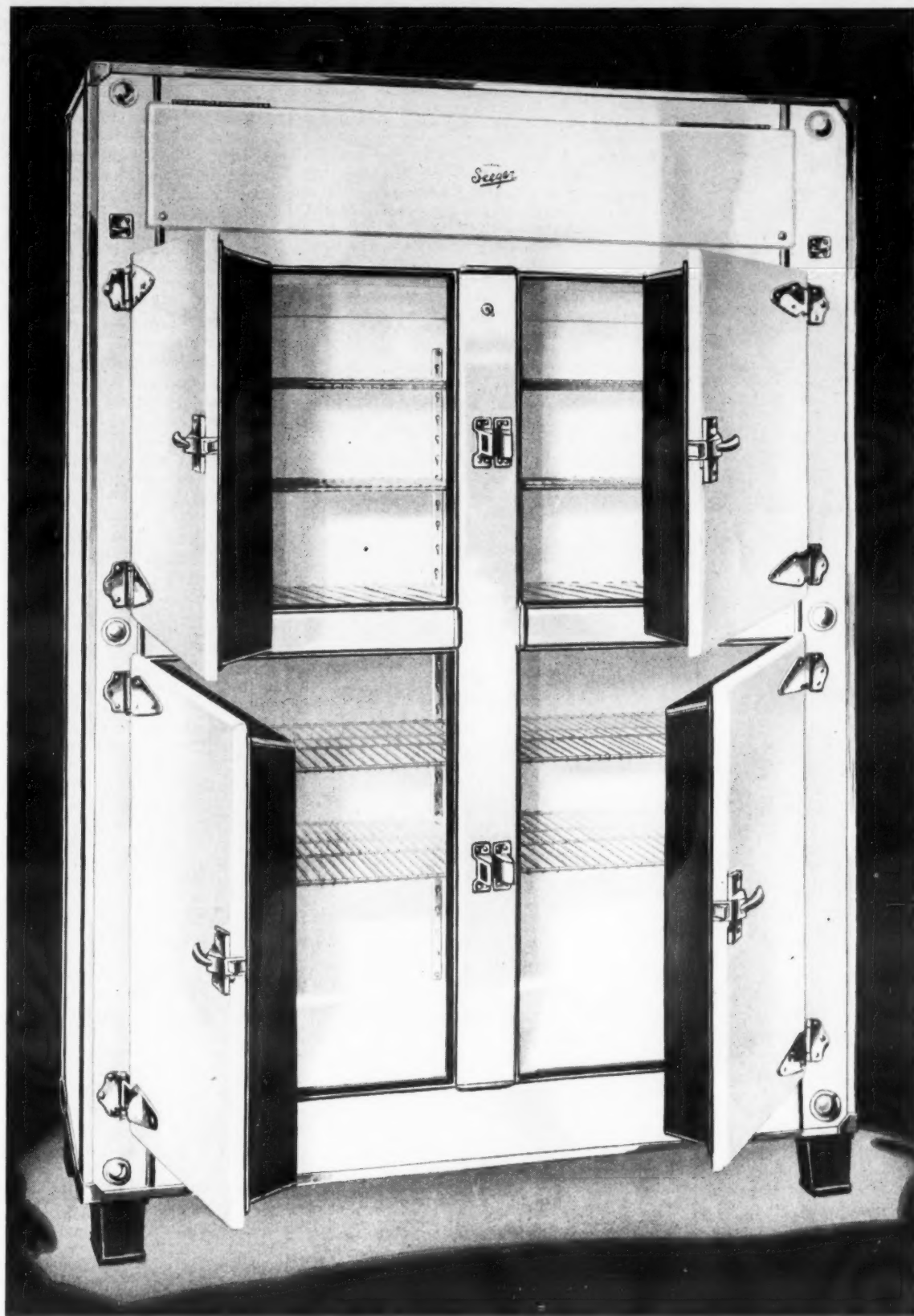
Case dimensions in all models are 32-inch width and 51½-inch height. The main display shelf is 26 inches wide, the delicatessen shelf 9 inches.

Almost the same as the deluxe models are the 1937 Quillen custom-built commercial refrigerators. There are the 6, 8, 10, and 12-foot cases of the same dimensions as the deluxe, and all the other features are of the same size. The custom-built job has three additions, namely the storage compartment, 24 inches deep and 18 inches high, the paper cutter, and the storage lights.

Prices on the custom-built refrigerators are several dollars higher than the deluxe in every instance, the range being from \$410 to \$1,386.

Quillen Bros. Refrigerator Co. has recently been housed in a new modernistic, one-story building at 1639 Lafayette Rd. The new home contains a display room, factory, and offices.

Carl L. Quillen is general sales manager and Clarence A. Quillen factory and production manager of the company, which was organized by the two brothers, Sept. 15, 1931. Others of the present personnel are R. L. Pennington, auditor and head of the accounting department, and T. M. Connell, in charge of the finance department.



Seeger Forty-four ALL PORCELAIN

There has never been a substitute for the famous ORIGINAL Seeger P-44 — it has become as definitely established as the mark "Sterling", which although frequently imitated, has never been equalled.

Seeger P-44 is "tops" in Commercial Cabinets.

NOW, HERE'S THE BIG NEWS — in spite of rising material and labor costs, sales volume and Seeger's modern manufacturing facilities have made possible drastic price reductions — just announced in Price Sheet No. 76. If it hasn't reached you as yet — 'phone — write — or wire the nearest office.

SEEGER REFRIGERATOR COMPANY SAINT PAUL, MINNESOTA

53-55 East 25th St.,
NEW YORK, N. Y.

655-57 So. LaBrea Ave.,
LOS ANGELES, CALIF.

835 West Washington Blvd.,
CHICAGO, ILL.

644 Beacon St.,
Kenmore Square, BOSTON, MASS.

1034 Mission St.,
SAN FRANCISCO, CALIF.

SPECIAL REPRESENTATIVES:

Meyer-Smith Company, Inc. 402 Broadway, Buffalo, N. Y.
Seeger Philadelphia, Inc. 835 No. Broad St., Philadelphia, Pa.

A.S.R.E. President Announces Ten 1937 Committees

NEW YORK CITY—Committee appointments for 1937 for the American Society of Refrigerating Engineers, as announced by H. M. Williams, newly elected president, include the following:

Executive committee: H. M. Williams, chairman; Crosby Field, Gardner Poole, L. S. Morse, David L. Flske, George E. Hulse.

Finance committee: W. R. Hainsworth, chairman; C. R. Roe, George E. Hulse.

Membership committee: Crosby Field, chairman; L. L. Lewis, H. C. Guild, James M. Larkin.

Section Committee: C. R. Logan, chairman; Rudolph Sommers, J. M. Larkin, L. A. Tucker, D. E. Perham, F. M. Cockrell, A. H. Luedicke, J. L. Shrode, F. C. Laufketter, J. C. Blair.

Entertainment committee: J. L. Shrode, chairman for spring meeting; chairman for annual meeting to be announced later.

Nominating committee: L. S. Morse, chairman; H. Harrison, A. R. Stevenson, Jr., A. M. Oakley, Glenn Muffly.

Committee on policy: Crosby Field,

chairman; H. Harrison, Chester Lichtenberg, L. S. Morse, Gardner Poole, A. H. Baer, H. D. Edwards, A. W. Oakley.

Joint committees: Commercial refrigeration equipment—Glenn Muffly, F. R. Zumbro; Air-conditioning standards—W. L. Fleisher, L. A. Phillip, W. E. Zieber, Prof. H. J. Macintire, Glenn Muffly.

Committee for the promotion of standards: Chester Lichtenberg, chairman; Crosby Field, Lee Nusbaum, C. L. Svenson, L. A. Phillip.

Committee on refrigeration as applied to agriculture: W. R. Woolrich, chairman.

Mr. Williams also has announced that the personnel of the various sectional committees cooperating with the American Standards Association will remain the same as during 1936.

Jamita Co. of Jacksonville, Fla. Is New Standard Body Outlet

NEW YORK CITY—Standard Body Corp., manufacturer of refrigerated truck bodies, ice cream cabinets, and replacements parts, has appointed the Jamita Co. of Jacksonville, Fla., to distribute its line in the states of Alabama, Georgia, and Florida.

locking arrangement of hygrostat and thermostat control. The refrigerant flow control is by automatic thermal expansion valves in some cases, and flooded coils with float and back pressure valves in others.

Most of the stock cellars were originally equipped with direct expansion coils, hand controlled. Two large cellars have been added, however, and these are conditioned with Carrier cold diffusers of the brine spray flooded automatic control type.

YEAST STORAGE ROOM

In the new yeast storage room has been installed a unit conditioner of the brine spray truly air-conditioned type.

In this installation, Mr. Jones explained, refrigeration is being supplied to a group of evaporators of all types and all methods of hand and automatic controls.

The refrigerant supplied, he pointed out, must not only be adequate under highly variable load conditions, but must be of a quality that will not impose limitations on the various types of evaporators and methods of control.

One new refrigerating machine of 200 tons capacity has been added to the engine room equipment. This unit is a Carrier centrifugal refrigerating machine.

The centrifugal compressor is driven by a steam turbine, which takes high pressure steam and delivers it at approximately 20 lbs. back pressure into the system supplying the process or heating requirements. Paralleling this turbine is a mixed pressure bleeder turbine, which takes high pressure steam and drives electric generators which supply the a.c. and d.c. power for the brewery.

BLEEDER CONNECTION

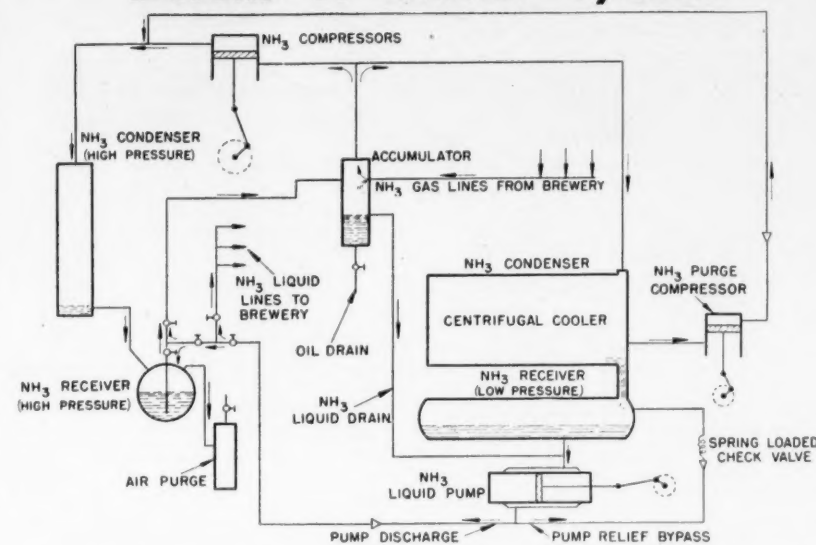
In this turbine the steam, after a pressure reduction to 20 lbs., is delivered through the bleeder connection to the process line. The rest of the steam required for power generation passes on through the low pressure stages to the steam condenser.

The flow of steam through the bleeder connection may be reversed. This will occur automatically when the process steam requirements are more than satisfied by the back pressure turbine driving the centrifugal compressor. This excess then passes through the low pressure stages of the power turbine and generates useful power with a corresponding reduction in the high-pressure steam. The steam turbine driving the centrifugal compressor is thus fitted into the brewery heat balance and low cost power is obtained by utilizing the energy of the steam while impairing its heating value only slightly.

Condensing water is supplied from a well at a temperature of 55° F. the year round. After passing through the condenser of the Carrier machine, it goes to the steam condenser, where it is heated to temperatures which vary, under load conditions, from 100° F. to 145° F.

Since this water is in no way contaminated by passing through brass tube condensers, said Mr. Jones, it is suitable for brewery use and its heat content is conserved. The condensing-water supply is, therefore,

Details of Carrier System



The drawing above shows the arrangement and general hookup of the Carrier refrigerating system of the type installed in the Narragansett Brewery. The installation is described in the accompanying article.

fitted into and is a part of the heat balance.

200-TON CAPACITY

The Carrier centrifugal machine has a rated capacity of 200 tons under its normal condition of operation. This operating condition under full load is about +5° F. to +8° F. evaporating temperature and 70° F. to 75° F. condensing temperature. The machine is a self-contained unit, consisting of the compressor, the evaporator or cooler, and the condenser.

It is also arranged for accommodating the driving unit, which in this case is the turbine previously referred to. The cycle of operation is the same as any other compression system, but the various elements differ radically from the systems employing reciprocating compressors.

The centrifugal, the compression element, is connected on the discharge or high pressure side to the condenser. Cooling water flows through the condenser tubes. The refrigerant is condensed and is returned to the cooler through the float trap where expansion to the lower pressure in the cooler occurs.

The liquefied refrigerant is evaporated in the cooler and extracts heat from the brine flowing in the tubes; the vapor generated passes to the inlet of the compressor and the cycle is completed.

CARRERE NO. 2 USED

The refrigerant used with this machine is known technically as Monofluorotrichloromethane. As this is a rather unwieldy name, we call it Carrene No. 2.

It is related to and belongs to the same family group as Freon. This refrigerant, however, has the relatively high boiling point of +75° F., which means that the condensing pressure at this installation, where we have 65° F. to 70° F. outlet condensing water temperature, is at a slight vacuum.

The evaporating pressure corresponding to +5° F. is about 24 inches vacuum. All parts of the system, therefore, operate at a pressure less than atmospheric.

LOW PRESSURE

The fact that the pressures are very low means that the volume of gas to be compressed is large. The 200 ton compressor installed here operates at maximum speed and has a pumping capacity of about 6,000 c.f.m. or about 30 c.f.m. per ton.

The cooler shell is cast iron and tubes and tube sheet ordinarily are brass or copper. In this installation ammonia is being condensed in the cooler tubes, so the material used is steel with steel tube sheets. The tubes are not submerged in the refrigerant, but a low head refrigerant pump is used to pump the refrigerant from a depression in the base to a distributing system located over the tube surface. This keeps all of the surface completely wetted with refrigerant and at the same time permits plenty of space for the gas generated to get away.

The result is very effective heat transfer. The vapor passes from the cooler to the compressor inlet through eliminators which take out any liquid entrainment and only saturated gas enters the compressor.

The compressed and heated gas flows across the condenser tubes toward the opposite lower corner where the coldest inlet water comes in. Mr. Jones explained that since the pressures in the system are below atmospheric, and leakage will be inward. This air will find its way into

the condenser and will tend to concentrate at the coldest point where the cold inlet water comes in.

At this point a baffle is located, from which the air and refrigerant mixture is led to an evacuator. Here most of the refrigerant is recovered before the air is evacuated from the system.

'MULTIPLE COMPRESSION'

It is well known among refrigerating engineers, declared Mr. Jones, that capacity can be increased and power per unit of refrigeration can be reduced by cooling the warm liquid that flows from the condenser to the cooler in steps. With reciprocating machines this is called "multiple compression."

These economies can be obtained with a centrifugal because of the multiple stages of compression, he said. The liquid from the condenser passes first to the economizer, where its pressure is partially reduced and the liquid partially cooled. The resulting flash gas enters the second compression stage. This gas is compressed through only two stages instead of three, with a resulting decrease in power. Increased capacity is obtained because the first stage is relieved of this amount of gas.

The compressor operates at a speed which varies, depending on load, between the limits of 4,200 to the maximum of 4,800. Its characteristics are the same as a centrifugal pump or fan.

The head in this case may be considered in terms of temperature, said Mr. Jones, since a gas compressor is after all a heat pump, which, in effect, lifts the heat from a low temperature level to some higher level where it can be discarded. Since the head required will vary somewhat

(Concluded on Page 9, Column 1)

- INDUSTRIAL APPLICATIONS -

Brewery Refrigeration System Uses Waste Steam

PROVIDENCE, R. I.—A new refrigeration application which permits almost complete heat balance by the use of steam formerly wasted was outlined before the Associated Engineering Societies of Providence meeting here Jan. 29.

Held at the plant of the Narragansett Brewery in Providence, the meeting was addressed by Willis H. Carrier, chairman of the board of Carrier Corp., and Engineers Walter Jones and Cecil I. Elliott, also of Carrier.

Mr. Jones and Mr. Elliott, who with Mr. Carrier perfected the refrigerating application, explained the centrifugal refrigerating machine installed in the brewery by Carrier.

PRODUCTION COST CUT

Mr. Jones said one of the advantages of the new application was a substantial reduction in production costs combined with increased efficiency and modernization.

"While much of the original refrigerating equipment has been retained, new and more modern equipment has been installed for practically all services," he said.

"The brewery as originally equipped included reciprocating ammonia compressors in the engine room and direct expansion ammonia evaporators in the brewery.

"This basic system has been retained and all additions and changes for brewery services have been fitted into the direct expansion ammonia system."

One Carrier centrifugal refrigerating machine of 200 tons capacity has been added to the engine room equipment. The centrifugal compressor is driven by a steam turbine which takes high pressure steam and delivers it at approximately 20 pound back pressure into the system sup-

plying the process or heating requirements.

"The steam turbine provides low cost power because it is fitted into the brewery heat balance," Mr. Jones said. "The steam passing through the turbine is perfectly clean; it is free from contamination by oil and can, therefore, be used for any heating purpose, including the brew kettles."

FERMENTING CELLARS

Mr. Jones told the engineers that of changes made in the evaporating system "probably the most noteworthy are the fermenting cellars."

"All of these cellars have been equipped with modern air-conditioning equipment of the multiple unitary type," he added. "I say 'air conditioning' advisedly because this equipment brings under simultaneous control all the factors which constitute true air conditioning — namely — temperature, humidity, air motion, ventilation and air purity."

To accomplish this, under all conditions of loading and at all seasons of the year, unit heaters are installed as an integral part of the unitary equipment, Mr. Jones explained.

Temperature and humidity are controlled automatically by an inter-

● No company is continuously successful for a period of 83 years without sound manufacturing and merchandising policies—without real value being given for every dollar received.

The extensive 20-acre CURTIS plant, where every manufacturing process is under complete control, is a result of adhering to this policy since 1854. Only the finest materials and processes are used in the construction of CURTIS Condensing Units. Every point of design reflects engineering experience that can be gained only over a long period of time. Quality built the CURTIS plant and quality insures the care-free, efficient performance of Curtis Units.

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- BLAST HEATING SURFACE
- CATALOGS ON REQUEST

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DETROIT, MICH.

Centrifugal Machine Using Low-Pressure Refrigerant Installed in Brewery

(Concluded from Page 8, Column 5) with the load imposed and the amount of condenser water used, it is evident that speed control is desirable.

Automatic speed control can be obtained with steam turbine drive by using a thermostat located in the material to be cooled. This thermostat operates directly on the oil governor controlling the turbine speed. With this control the centrifugal machine adjusts itself automatically to the load imposed.

Before the installation of the centrifugal unit, Mr. Jones explained, the brewery was equipped with a conventional type of ammonia compression system, consisting of two ammonia compressors, three vertical shell and tube ammonia condensers, a receiver, and auxiliary equipment common to such a system.

EQUIPMENT INSTALLED

The new equipment installed in addition to the centrifugal unit consists of two ammonia receivers, a motor driven ammonia liquid pump, a suction line accumulator, a small ammonia purge compressor, and interconnecting piping and controls.

"The distinctive feature of this installation," said the Carrier engineer, "lies in the fact that the low pressure ammonia gas returning from the evaporators in the brewery, instead of being compressed and liquefied at the usual high pressure, is condensed in the cooler of the centrifugal machine at the same low pressure. The resulting liquid, which is at the low temperature, is pumped back into the high pressure liquid supply line by the ammonia liquid pump.

MACHINE ARRANGEMENT

"The centrifugal machine is arranged so that it can operate either alone or in parallel with the old ammonia compressors. The ammonia suction lines returning from the brewery go first to the accumulator, where slugs of liquid ammonia and oil are deposited and drained.

"The liquid ammonia is drained directly to the suction of the ammonia liquid pump, and the oil is drained to a suitable pail or barrel.

"A separation of the oil and liquid ammonia takes place in the accumulator because of difference in gravity, and level indicators at the side tell the operator when to drain oil. Draining of the liquid ammonia is entirely automatic.

"It is interesting to note that since the accumulator was installed, many barrels of oil have been drained from the system. This oil previously clogged the evaporators and lowered their efficiency.

"From the accumulator the low pressure gas can go either to the ammonia compressor or the cooler of the centrifugal machine. Let us suppose that the load is heavy and both the centrifugal and the ammonia reciprocating compressors are required. The gas taken by the ammonia compressor is compressed and liquefied at the high pressure (say 180 lbs.) in the high pressure ammonia condenser and then drains to the high pressure receiver.

GAS GOES TO COOLER

"The remaining gas goes to the cooler of the centrifugal machine, which is also the low pressure ammonia condenser. Here it is condensed at low pressure and temperature (say +15° F.) and drains to the low pressure receiver. The ammonia liquid pump takes it from the receiver and pumps it into the supply line against the high pressure established by the ammonia compressor.

"The ammonia vapor is condensed in the cooler tubes because the Carrene temperature in the shell and, consequently, on the outside of the tubes, is maintained a few degrees below the temperature at which the ammonia will condense, thus establishing the necessary temperature difference for heat transfer.

"A check valve is located in the ammonia liquid pump line to prevent return of liquid and loss of pressure if the pump is shut down. The liquid pump is of the slow speed reciprocating type. It operates with a very low submergence, that is, the liquid head on the inlet side.

"Since the liquid ammonia is at the saturation temperature, some flashing into gas occurs at the pump, and the pump is, therefore, selected overcapacity to allow for this loss. When the ammonia compressors are shut down and the centrifugal is oper-

ating alone, the ammonia liquid pump must not only supply the liquid to the lines, but it must also maintain a constant pressure. As the pump is overcapacity, a spring loaded check by-pass valve is installed to return the excess to the low pressure receiver.

"To obtain the best heat transfer conditions in the low pressure ammonia condenser, six passes are provided. By graduating the amount of surface in these passes—a large amount in the first pass and a small amount in the last pass—the velocity is high, which sweeps the liquor ammonia to the drains at the end each pass and also prevents the accumulation of any noncondensable air which may be in the system.

"It is inevitable that air will get into the system due to opening up lines from changes or repair. This air will be brought to the low pressure ammonia condenser and will impair its efficiency if allowed to remain.

"To get rid of this air, a small 1/2-ton ammonia compressor is connected, with its suction, to the last pass, where the air will accumulate. This compressor pumps the air into the high pressure system, which is provided with an air purge of the usual type venting to the atmosphere.

"One change was made to the system after installation which is not indicated on this diagram. When the centrifugal and the ammonia compressors were operating together, the supply of liquid ammonia going to the brewery, being a mixture of high temperature and low temperature, varied considerably in final temperature, and this affected the setting of hand expansion valves.

"To correct this, a line was run from the high temperature receiver to the accumulator so that this high temperature liquid is first expanded in the accumulator and reduced in temperature, and all of the liquid is supplied to the brewery by the pump at the uniform low temperature.

"This is quite an advantage since the cold liquid supply eliminates the generation of flash gas at the expansion valves, and increases the efficiency and smooth functioning of the evaporators."

Nine Kansas City Distributors In Better Homes Exhibit To Open Feb. 20

KANSAS CITY—Nine appliance distributors will display products at the annual Better Homes and Flower Show to be held in the Municipal Auditorium here Feb. 20-27.

The list of exhibitors and products to be shown includes: E. S. Cowie Electric Co., Electrolux; American Electric, Crosley; Jenkins Music Co., Stromberg-Carlson radio, Fairbanks-Morse and Ice-O-Matic refrigerators; Columbian Elec. Co., Westinghouse; Richards & Conover Hdw. Co., Kelvinator; Frigidaire Corp.; General Electric Supply Co.; Earl J. Goetze, Inc., Leonard refrigerators and RCA Victor radios; Moser & Sour, Inc., Norge.

Norge Co. of Missouri Moves Into St. Louis Mart Building

ST. LOUIS—Norge Co. of Missouri, Norge distributor in this territory, now occupies space on the second floor of the Mart Building, 12th and Spruce Sts., here, according to A. E. Bottenfield, president. The distributorship is holding open house at its new quarters today and tomorrow.

Poole Discusses Quick Freezing Progress at Chicago A.S.R.E. Dinner Meeting

CHICAGO — "Progress of Quick Freezing During the Past Four Years" was discussed by Gardiner Poole, vice president of the American Society of Refrigerating Engineers, president of Frosted Foods, Inc., and director of Birds-Eye Laboratories, at the monthly dinner-meeting of the Chicago section of A.S.R.E., Feb. 2, at the Hotel LaSalle.

Mr. Poole, as president of the American Institute of Refrigeration, and as chairman of the research committee of the Association of Refrigerated Warehouses, as well as in his other capacities, has gathered an abundance of material on quick-freezing processes. He discussed the technical as well as the economic side of the industry's development.

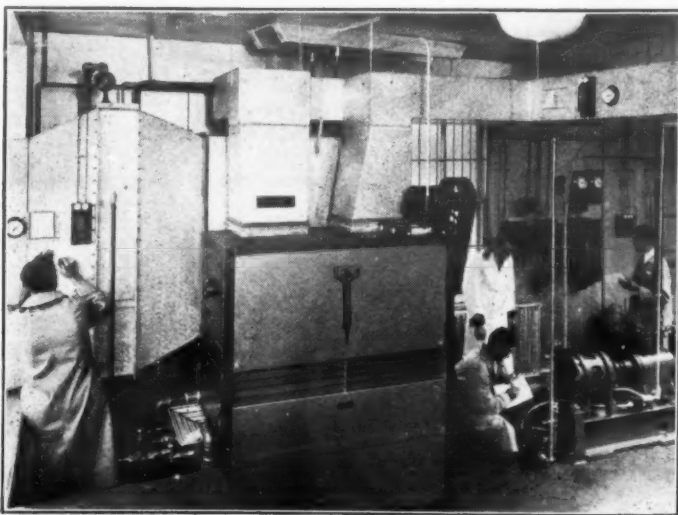
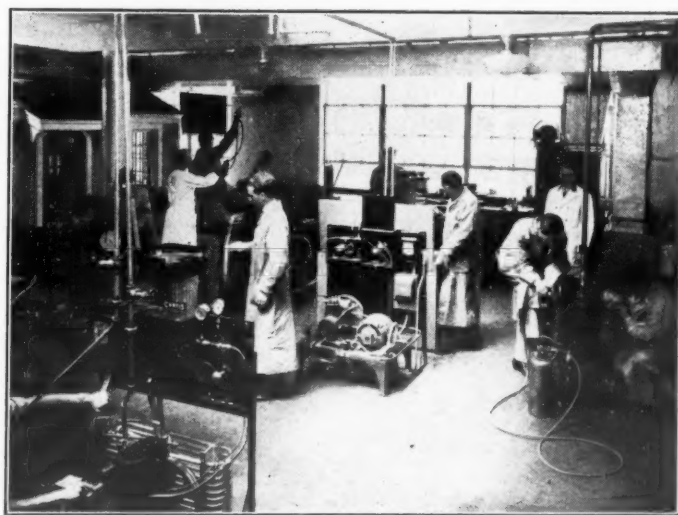
Horace G. Bloom Joins Apollo Distributing Co. in Newark

NEWARK—Horace G. Bloom, formerly associated with Kelvinator Corp.'s field organization, has joined the sales staff of the Apollo Distributing Co., Crosley distributing firm in this city.



*They Came —
They Saw —
They Praised!*

Over 100 Visitors from the Industry - - - Executives, Engineers, Owners - - - Inspected Our Laboratories, Shops, and Other Facilities in the Past Thirty Days!!!



Two views of the Institute's Laboratory and Shops. Above: Partial view of Commercial Refrigeration Section with air conditioned house, within an air conditioned building, in background. (Less than one-half of equipment in this department shown in photo.) Below: One of two "year 'round" air conditioning systems in complete operation.

HERE is what some of them told us after seeing the work we are doing:

"You are doing the finest job of training that has ever been done in this or any other industry"—
"Don't see how you possibly could make your training more thorough and practical"—
"Every manufacturer, distributor, dealer, and contractor in the industry should know about the work you are doing."

Won't you, too, come and see the training job we are doing? We believe you will be pleased . . . even amazed, as others have been . . . with the lengths to which we are going in preparing men to do the work you want done . . . with the unusual qualifications of the men we train . . . with the remarkable completeness of our laboratory and shop facilities.

This training, as you probably know, is actually directed and supervised by a manufacturer-appointed Board of Governors, made up of prominent

executives and engineers in the industry. These men, coming from their various plants to Chicago for regular conferences at the Institute, make sure that our training fits every need of the industry, and that men accepted by us are really trained as the industry wants them trained. We believe this is the only training conducted in this way.

May we suggest that the next time you are in Chicago, you reserve at least an hour of your time for a trip to the Institute? The more than 100 men from the industry who took time out of busy days for such a visit, while in Chicago last month, said they wouldn't have missed it for anything.

All you have to do when next in Chicago, is phone us—Longbeach 6100. From then on it will be our job and our pleasure to bring you out to the Institute and return you to any point in the city to which you may wish to go.

Seeing is believing. So won't you come and see for yourself?

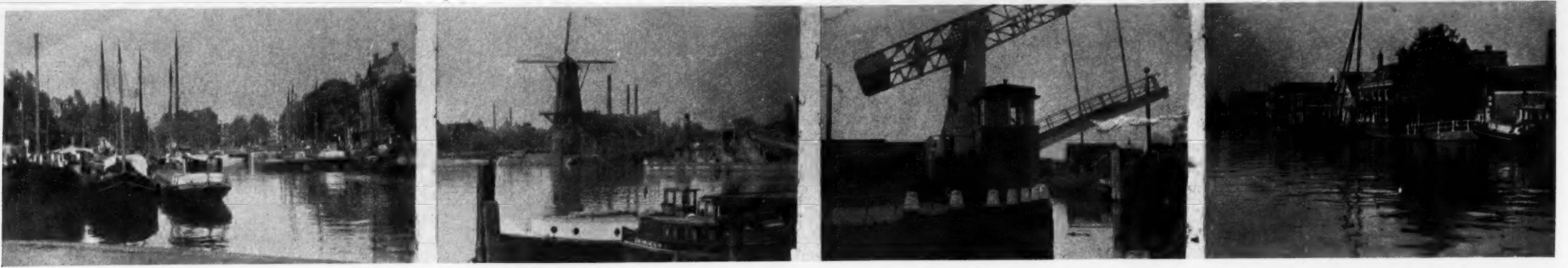
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Dutch Canals Provide Last Word in Facilities for Transportation by Water



(1) and (2) These two canal scenes are from the heart of highly industrialized Rotterdam. (3) Drawbridge of conventional Dutch design. The heavy top girder poises a counterweight, which reduces the power needed to lift the bridge. (4) Twilight along a Dutch canal, lined with residences.

AROUND THE WORLD WITH GEORGE F. TAUBENECK

The Netherlands, a land wrested from the sea by the ingenuity, industry, and persistence of a hardy race of people, is a very small country with an exceedingly big influence in world commerce.

Scene of the Seventh International Congress of Refrigeration, doors of The Netherlands were flung wide open to delegates, of whom Editor George F. Taubeneck was one, and all sorts of facilities were extended to enable visitors to see the country from stem to stern.

Hence the editor's "coverage" of this important nation is probably more thorough and extensive than that of any other yet reported in his "World Series" travelog. Finishing the reports on refrigeration firms in this issue, the story continues with an analysis of political and economic phases of this advanced nation.

Standards of Living

Important differences in the manner of living will have to be made before electric refrigeration can be expected to make the gains in Holland which it has already made in the United States, in the opinion of W. J. VAN WULFFTEN PALTHE, former Kelvinator distributor in the Netherlands.

Home owners are not used to refrigerators or ice water in their homes, Mr. Van Wulfften Palthe points out. Shops will bring food, in any quantity, any distance every day, so there is no need to store food over week-ends. Also, families buy from day to day. No one ever thinks of buying a big piece of meat to last for a week.

Potentially, there is a great market for electric refrigeration in the country. Of the 8,000,000 residents in the Netherlands, approximately 80% live in homes wired for electrical service.

Climatic conditions, however, are not overly in favor of the adoption of refrigeration, Mr. Van Wulfften Palthe contends. Highest temperature in summer is about 80° F., lowest in winter, about 14° F. The warm months are from May to September. Average summer temperature is about 67° F.; average winter temperature about 34° F.

Importation of American refrigeration equipment began in 1927, the former Kelvinator distributor says. He was one of the country's pioneers in this respect. Before that time, some European makes were known in Holland, but these did not operate automatically and were all of the water-cooled variety, making them inconvenient for household use.

About 7,000 pieces of refrigeration equipment are in use in Holland at the present time, Mr. Van Wulfften Palthe says. Of this number, about 4,000 are commercial machines, and about 70% of them are used in butcher shops. Other commercial uses are principally in hotels and restaur-

rants. Only about 3,000 household units are in use in the country, he says.

Firms selling American refrigeration equipment in the Holland market include: Rietschoten & Houwens, Rotterdam (Frigidaire); Marynen Waldorpstr., the Hague (Kelvinator); Mijnsen, Amsterdam (General Electric); Servel Tadema, Amsterdam (Servel); and Copeland Bouwman, Amsterdam (Copeland).

Sales of air-conditioning equipment in Holland, in Mr. Van Wulfften Palthe's opinion, are severely handicapped by the cold climate. There are practically no heat waves, he points out. Another deterrent to mechanical condensers is the constant water temperature prevailing in the country, 53° F., making this a good agent for refrigeration.

The few air-conditioning systems now in use in Holland are all equipped with a water-curtain system, Mr. Van Wulfften Palthe recalls. These include the Insurance 1845 building, the Tuschinsky Picturehouse, the State Railway office, and perhaps one or two others.

The American Way

Mr. van Palthe is a big, fine-looking chap who has earned a livelihood in many parts of the globe—in Java and the Orient, and in several European countries. At one time he was the Kelvinator distributor in Holland.

He is now interested in representing American air-conditioning manufacturers in the Dutch East Indies, and will welcome correspondence on that subject.

Holland is home, but "in Europe they make business too complicated" to suit him. He vastly prefers the American Way of doing things. "The long arm of the law," he says, is always reaching over your shoulder in Europe."

Mr. van Palthe went with me while

I checked passport visas with consuls of the various nations I was to pass through next (Germany, Denmark and Sweden). After a spell of redtapery, he exclaimed: "See? That's what I mean. You wouldn't have to go to all that trouble to make a 600 mile business trip in the United States."

15 Men Per Copy

Present Kelvinator distributor, N. V. Technisch Bureau Marynen, is a big firm, live and alert. Mr. Harold S. Schwalbach of the distributorship says that they are really just learning about the business. When they know more about it, and if they can ease the prices down a bit, he feels that there's a potentially big refrigeration business in Holland awaiting his concern.

The News has been of considerable help in educating himself and his organization, he claims.

"Each week 15 of our men read REFRIGERATION NEWS from front to back," he states. "Sometimes we think we ought to invest in another subscription!"

Not long ago he met Howard Lewis, Kelvinator treasurer and vice president in charge of export sales, at a banquet, and was considerably impressed. Mr. Lewis, he feels, understands the European market situation better than any American he has ever met.

Kelvinator household models are sold in Holland through dealers working on a 30% discount. Commercial salesmen work out of the home office on a strict commission-against-drawing-account basis.

Headquarters are maintained at The Hague, where a big showroom is literally filled with Kelvinator equipment of all sizes. This showroom however, is not exactly on a prominent corner. It took me an hour and a half to find it, even though I had the address, and though it is within half a mile of my hotel (The Terminus).

Electrolux Begins

Up until 1936, Electrolux wasn't much of a factor. But last year the Dutch gas utilities began active co-operation with and promotion on the Electrolux refrigerator, and they now hope to get going in earnest in 1937.

A. F. M. Stubbe is managing director of the Dutch firm, N. V. Electrolux (also called Electrolux house). The firm is located opposite the Queen's palace at the Hague.

Holland Engineering

N. V. Hollandsch Ingenieurs Mij. (Holland Engineering Co.) has completed over 1,500 commercial refrigeration installations in this country.

Regular customers of the company include hotels, restaurants, butchers, shipping companies, and the Royal Dutch Navy. The firm also received an order for Her Majesty, the Queen

of The Netherlands.

Holland Engineering Co. made an installation for Philips Electric Bulb Factories, Eindhoven, requiring the production of extremely low temperatures, and also installed the equipment for the country's first open-air artificial skating rink here.

For two years, Holland Engineering Co. has been selling Norge products. The company operates its own showroom and service repair shop.

M. E. A. W. MOHR and J. Ph. TOLLENAAR direct the company;

Noted Scientist



Prof. Rudolph Plank, director of refrigeration research at Germany's famous Karlsruhe Technical Institute, was prominent in the sessions of the World Congress of Refrigeration at The Hague, Holland.

F. HENNEMAN manages the refrigeration equipment.

Besides handling refrigeration equipment, the firm imports foreign machinery of various types, and maintains the sole Dutch agency for Babcock & Wilcox, London, and James Howden & Co., (Land) Ltd., London and Glasgow.

Holland Engineering Co. also exports Dutch engineering products, especially cane sugar machinery to British India, and oil refining machinery to Roumania.

'You Can't Be Smart In Economics' - Altes

"You can be smart in engineering," declared Mr. Altes, the G-E distributor, "but you can't be smart in economics. This idea of economic dictatorship is ultimately foolish. You might just as well try to regulate the weather."

"Artificial methods of economic control merely postpone the crisis."

He is a bitter-end deflationist. A

great many things in The Netherlands, he believes, need to be written off — obsolete dwellings, railways, plants. And they will be, too, he thinks.

The Dutch are a progressive people. They like new things. They are well-educated, and they have native intelligence. Possessing a small country (which itself did not exist before they pumped the sea out of it) with almost no natural resources, they have become wealthy by trading all over the world.

Great linguists, inveterate travelers, they can and will do business with anybody.

What's more, The Netherlands long believed in, and practiced, free trade. Until very recently, you could buy rafts of products cheaper there than in the country of origin. It became known as an international dumping ground.

But recently the seeds of nationalism have begun to send up shoots from the Dutch soil. And Mr. Altes, like many another Dutch tradesman, doesn't like the result.

Farm Bounties

Take the matter of "protection" for agriculture. This has taken the form of state bounties for agricultural production. As one result, wheat growing in The Netherlands has increased enormously, to the detriment of American flour imports. Even so, some United States flour must be mixed with the Dutch grade before it will bake well into bread!

A high duty was placed on sugar, in order to encourage local beet growers. That not only raised the price to Dutch consumers, but closed almost a hundred Dutch-owned sugar mills in Java, a Dutch colony!

This, in turn, and along with similar measures, cut into the shipping trade between The Netherlands and Java, and so a shipping subsidy had to be ordered. Thus the vicious circle continues.

But not all the Dutch "new deal" discourages Mr. Altes. Like most of his countrymen, he thinks the slum clearance program and the various forms of state insurance against unemployment, incapacitation for work, and old age, are working out pretty well.

Social Insurance

Since the matter of social insurance has been creating so much comment here in the United States, it might be a *propos* to discuss the Dutch system of social security, which is said by many economists to be one of the most advanced in the world.

The Dutch have no war debt to pay, they have no foreign liabilities to worry about, they have no reparations to make, they have no reconstruction to finance as do other countries as an

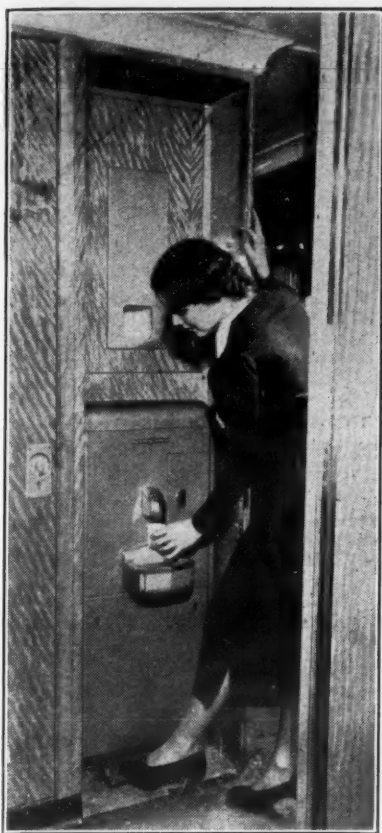
(Concluded on Page 12, Column 1)

Activities of Refrigeration Industry in the Netherlands Conducted in Unique Surroundings



(1) Dr. J. F. Koopman, foremost Dutch refrigeration engineer, welcomes delegates to the Seventh International Congress of Refrigeration at The Hague. He is the very tall, hatted gentleman facing the camera. (2) Entrance to the building where the Congress was held. (3) This canal-street in Amsterdam runs past the headquarters and showroom of Mijnsen & Co., General Electric distributor. (4) The well-glassed, modern building at the right is a department store in Rotterdam, typical of the new architecture.

On the Hiawatha



The new electric water cooler developed by General Electric for use in Pullmans is shown here in use on the Milwaukee Road's new streamliner.

Refrigeration Principles Used For Preservation of Forage

COLUMBUS, Ohio—The benefits of refrigeration, long available to men, are now to be available also to cattle and other farm stock, through experiments proved successful in refrigerating alfalfa hay at Ohio State University.

Those same elements present in fresh fruits and vegetables are needed by farm animals, too, explains Dr. Oscar Erf, who conducted the Ohio State experiments.

To preserve them, the freshly cut alfalfa is put into airtight silos, and packed with dry ice.

McCray Issues Convention Number of House Organ

ST. LOUIS—McCray's St. Louis branch issued a local edition of the *McCray News*, company house organ, to give dealers attending its convention here Jan. 15 and 16 pertinent information about the program of the two-day session. Fifty dealers from Missouri and Illinois attended the meeting, which was held in Hotel Coronado.

R. H. Rehwinkel, McCray general sales manager, was in charge of the convention, assisted by J. W. Hart, secretary, G. J. Hopkins, chief engineer, and Charles D. Stoll, district manager.

Representing the St. Louis branch office at the meeting were E. E. Barbee, branch manager; Herbert German, office manager; John G. Doerr, C. P. Douglas, Julius Herbst, and J. K. Goin, salesmen; J. E. Burrows and Fritz Schnieder, service men; and O. Doerr, refinisher.

Refrigeration Division Will Not Meet during Winter Conference of Nema Starting Feb. 14 in New York

NEW YORK CITY—Some 110 section, group, and committee meetings will be held during this year's mid-winter conference of National Electrical Manufacturers Association in the Waldorf-Astoria hotel during the week of Feb. 14.

The Refrigeration Division will not meet during the conference. Next meeting of this group will be at Cleveland on March 9.

A meeting of the Policies Division will be held at 4 p.m. Feb. 18 in the

hotel's west foyer, but will be closed to all except the Association's members and invited guests.

Annual banquet, to be held the night of Feb. 18 in the Starlight Roof of the Waldorf-Astoria, will feature a floor show with J. Harold Murray, stage and radio star, as master of ceremonies. Acts will include Edgar Bergen, ventriloquist, star of the current Rudy Vallee hour; "the Hippodrome Horse," featured at the Rockefeller Center Rainbow Room.

Kelvinator Kansas City Branch Adds Three Merchandising Men

KANSAS CITY—J. T. Dalton, Kansas City regional manager for Nash-Kelvinator Corp., recently added three men to his regional staff—G. L. Leigener, W. A. Wilson, and J. H. Wimberly, Jr.

The men have been assigned to the following branches of merchandising: Mr. Leigener, washing machine sales; Mr. Wilson, range sales; and Mr. Wimberly, merchandising specialist.

Work of the men will supplement the duties of two district managers.

COMMERCIAL REFRIGERATION

Refrigerated Locker Service Gives Farmer Fresh Meats & Vegetables Year 'Round; First Plants Built in Washington

YORK, Pa.—Rapid growth and spread of refrigerated storage locker services in many rural sections of the country has brought increased business to manufacturers of commercial refrigeration equipment, and a "new deal" in living standards to the average American farmer, according to J. W. Emig, industrial sales manager of York Ice Machinery Corp.

These refrigerated locker plants offset the rigid limitations of annual growing seasons by enabling people living in rural areas to preserve their produce so that they may have fresh meat, vegetables, and fruit the year around.

160 LOCKERS COOLED

First of such plants, says Mr. Emig, was constructed by the Uniontown Cooperative Association, Uniontown, Wash. York engineers, called in to figure on the job, prescribed a 3 by 3-in. ammonia compressor serving 1½-in. pipe coils. One hundred and sixty lockers were served by this equipment.

Since the Uniontown installation demonstrated the success and practicality of the locker idea, dozen of such plants have sprung up not only in the northwest, but in other sections of rural America as well, Mr. Emig states.

Some of these locker services are operated by creameries, cold storage, or ice plants which have added the rental or refrigerated lockers to their regular business. In many instances, however, these locker plants have been started as individual enterprises devoted exclusively to the rental of refrigerated storage space. These individual concerns, as well as the subsidiary projects, have prospered, and more spring up every year.

8-CU. FT. CAPACITY

Most lockers are made of wood, and commonly measure 2x2x2 feet. This size locker will hold 300 or 350 lbs. of meat. Partitions are either of wood or galvanized screen with ½-inch mesh. A temperature of 10° F. is used in figuring refrigeration requirements. Present practice calls for thermostatic expansion valves feeding 1¼-inch pipe coils.

Most of these plants offer some supplementary services which facilitate the use of the lockers, and augment the revenue from them. Most of them, for instance, have a butcher in attendance who will cut a quarter of beef, hogs, or veal into convenient steaks, chops, and roasts. The charge for this service is 1 or 1½ cents per pound of meat. This charge usually covers the butcher's salary.

Many plants operate a complete meat market and grocery in connection with their storage service. In such a meat market, large cuts are sold for correspondingly low prices. Others have a pickle room whose services are available at a normal charge. Some operate a sausage kitchen with smokehouse, rendering kettles and other necessary equipment available.

OPERATION OF PLANT

Mr. Emig cites the Modern Cold Storage Co., Mount Vernon, Wash., as a good example of a thoroughly up-to-date refrigerated locker plant. Operated by Everett Hall and his son, this plant serves Mount Vernon and the surrounding farming community.

The building is constructed of lumber throughout, concrete being used only in the piers supporting the main timbers. The locker room is about 40 ft. long by 28 ft. wide. Five hundred and eighty lockers, measuring 2x2x2 ft., are arranged in rows four high. Room has been provided for addition of a fifth row at the top when needed. A 4-in. space at the floor allows for air circulation. Ten lockers were built by a local cabinet maker at a cost of about \$1.40 each, exclusive of locks.

FIRST, AND OPERATING COSTS

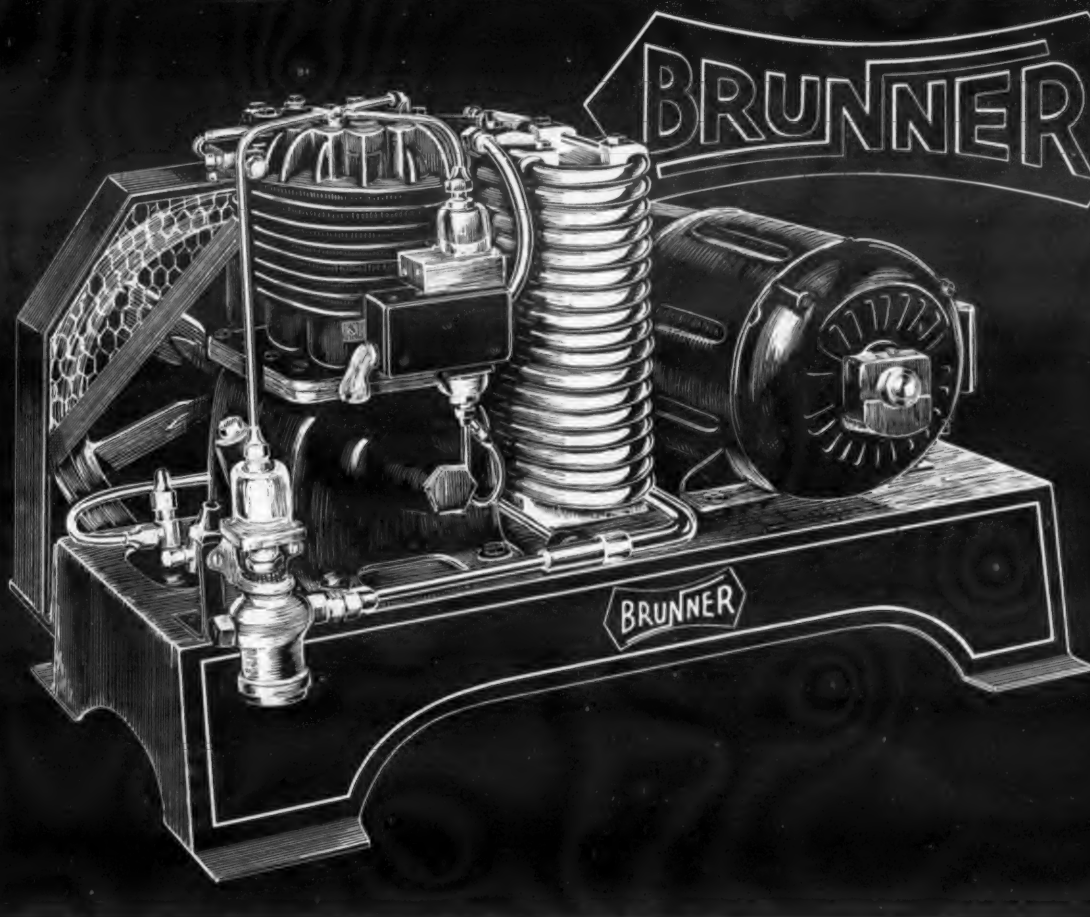
In the market which Mr. Hall operates for his customers, he sells a first grade meat purchased from established packing houses. This is sold to professional and business people of the town at a normal profit. These meats are kept in a 19 by 10 by 12-ft. general storage room.

Farmer's meats are butchered by Mr. Hall's son in a special beef cutting room. As a sideline Mr. Hall handles ice, and rents space for beer and other miscellaneous storage. In addition he has printed instructions for preserving all kind of meats, fish, game, fruits, and vegetables.

Total cost of the plant was \$11,600 including the land, building, refrigerating plant, and miscellaneous handling equipment. Power costs run approximately \$38 per month for the 15-hp. York compressor, a 2-hp. Vaughn meat saw, and a ¼-hp. water pump circulating cooling water through the refrigeration condenser. Mr. Hall had his own well dug at cost of \$200, and made connections with town water main in case of emergency.

After charging off operating costs, salaries, and depreciation, a project profit-and-loss statement shows a 10% annual return on the total investment in the plant.

THE BRONZE BEARING FOR THE PISTON WRIST PIN IS ACCURATELY DIAMOND BORED TO INSURE PERFECT ALIGNMENT AND MINIMUM WEAR



Just a detail? Of course it is. Yet upon the precision and durability of the piston pin and bearing depend to a large degree the life of the refrigerating compressor. Here is an element taking a considerable number of rotations per minute—and riding on cast iron won't do. This explains why the Brunner engineering specifies a hard bronze alloy at this vital point, and extreme accuracy of boring and alignment. •••• Just listen to a Brunner snap "on" and quietly purr—whether it's new or many thousand tons of refrigeration old. Extremely quiet! Naturally this means less wear and tear, greater serviceability. •••• You'll be interested in a detailed study of the Brunner construction and range of models, comprising 47 Condensing Units, air and water cooled for practically all refrigerating and air conditioning applications. Full information for quick reference in the Brunner Refrigeration Catalog. . . Your copy will be mailed promptly on request. Brunner Manufacturing Co., Utica, N.Y., U.S.A.

BRUNNER

BUILDS FOR *Greater* DEPENDABILITY

Holland Is a Land of Boats and Bridges - - and Bustling Business



(1) The number of bicycles in this picture, as compared with the number of automobiles, is not a typical ratio for Holland, which is a land of three million bicycles, but only a few thousand motor cars. The open car at the extreme right is an importation from America, a 1936 Auburn. (2) This is more like it. Bicyclists stopped at a traffic intersection in The Hague. (3) Business section of old Delft. (4) The American influence can be seen in the naming of the canoes in which these two young Dutchmen are enjoying an outing: "Tiger Rag" and "Raket."

AROUND THE WORLD WITH GEORGE F. TAUBENECK

(Concluded from Page 10, Column 5) aftermath of the war, their budget is balanced, and they enjoy a varying stream of wealth—or trickling, according to the times—pouring in from their colonies in the East Indies. Hence, they have both the time and the money to expend on social security.

The Dutch system is based on an attempt to calculate to a fine degree of accuracy a balance between donations, benefits, and operating expenses. Its success is due in part, a large part, to its flexibility.

There are four main divisions of social insurance, namely, invalidity and old age insurance, accident insurance (industrial and agricultural), sickness insurance, and unemployment insurance.

Specially created state labor boards and the state insurance bank have been entrusted with the supervision and enforcement of the program.

The local superintendence and execution of the accident insurance is vested in appointed inspectors, engineers, and medical advisers, in the controllers of the State bank at Amsterdam, and in the State labor boards.

Of course, the insurance system necessitates a certain amount of extra work and expense on the part of employers, especially if they engage a large number of workers.

Invalidity and old age insurance is compulsory for all wage-earners over 14 years of age, with certain exceptions and under specified conditions.

The exceptions are those persons in the active military service, those persons over 35 years of age at the time of their original employment, those persons earning more than \$1,200 (approx.) per year, those persons employed by companies which maintain satisfactory benefit systems of their own under legal and approved conditions, and all public employees who are entitled to government pensions.

Responsibility

Both employer and employee are held equally responsible for the insurance of the latter, and failure to comply with the specifications may result in prosecution of both parties, fines or imprisonment being the punishment.

According to the law, every citizen eligible for the insurance must apply for it to the proper local labor board within 14 days after being hired.

The employer makes all the contributions to the insurance funds, and the weekly payments are represented by special government stamps of the required value affixed to the insurance card of every insured employee. Stamps are issued through the local post offices and labor boards.

Upon the filling of each card with

stamps, the total amount of contributions represented by that card is entered into an insurance book carried by the insured employee, and a new card is given the latter.

Since the revision made in August, 1929, the scale of payments is based on the age and sex of the insured person. The required weekly contributions are:

Age of Employ	Male	Female
14 to 17 yrs.	\$0.16	\$0.16
18 to 20 yrs.	0.20	0.16
21 yrs. and over....	0.24	0.20

Provided that at least 150 weekly contributions have been made, benefits are payable for permanent invalidity

tions have been faithfully paid. There have been made during the 20 years 1,040 weekly contributions amounting to \$294.60, or 1,040 times the weekly sum of \$0.24.

Using the formula, the total amount of the contributions multiplied by 260 comes to \$64,896.00. Dividing this by 1,040 (the number of weeks the insurance has been in effect), we obtain the sum of \$62.40, and by adding to this amount 11.2% of the total contributions, or \$33.00, we get \$95.40. Thus, the invalidity insurance benefit coming to the man is \$95.40.

Thrifty Dutch

If the man is a typical Dutchman, he has saved up plenty for the proverbial rainy day, and the extra \$95.40, toward the creation of which he has not had to contribute at all financially, will come as manna from heaven.

post office within 24 hours after the injured person has received the medical attention.

An investigation is made, and the insurance benefits are determined by the insurance bank as soon as possible after the completion of the inquiry.

An alternative time limit has been set at 43 days from the investigation, during which period temporary benefits are paid. The beneficiary is informed by letter of his fixed payments, and he collects them from the post office in his neighborhood.

Payments date from the day after the accident and are made only if, according to a recognized medical authority, the injured employee is unable to resume his work three days after being incapacitated.

Provisions are made in the insurance policy whereby in the event of the employee's death part of the funeral expenses, if borne by the immediate

termine the proper classification of the insured employee's occupation.

It is possible to transfer the insurance risk to the company in which the person is employed, provided that such company is formally recognized and approved by the government. If it is legally incorporated, an association of employers may take over the risk just so long as the requirements set by the government are fulfilled.

Sickness insurance is compulsory for all workers (engaged by private concerns) who earn not more than approximately \$1,206.00 per year. Two per cent of their weekly wage is contributed to the sickness insurance fund, and the benefits amount to as much as 80% of their wages.

With official medical affirmation as to the illness, an insured employee begins to collect his benefits on the third day after leaving work. A maximum period of payments of six months has been stipulated, and Sundays are excluded from the record books.

The Dutch Government pays subsidies to the unemployment funds of the labor unions in The Netherlands, the amounts being fixed by law at 100% of the contributions made by the members of the union.

In reality, the government subsidies have usually exceeded the legal amount, especially during the winter when unemployment increases.

Government Housing Aid

Back in 1901, a law was passed by the Dutch legislature authorizing government loans and subsidies for housing development. In 1905, the funds were first provided, and from that year until the outbreak of the war in 1914 about 9,900 houses were constructed with government financial aid.

During the same period, a total of 12,918 houses were condemned as unfit for human habitation and were demolished.

Following the war, governmental activity in the housing program increased because of the acute shortage of dwellings and because of higher prices of materials.

From 1919 to 1934, about 714,000 new homes were built through the joint accumulation of public and private funds. This huge number was equal to half the number of houses actually existing in 1919.

In addition, many slum areas were razed, and towns were replanned so as to provide improved zoning and better recreational facilities.

Minimum standards of amount of daylight, cubic air space, and sanitary conditions were specified by the law of 1901. The law also required scientific planning for growing communities and for towns of over 10,000 population.

Government aid has been directed toward slum clearance and housing for the lowest income groups almost exclusively in the past 12 years.

Sunset in Woodenshoe Land



A sturdy old windmill stands guard over a quiet land at sundown. The outlines of the setting sun, clearly visible in the original photograph, were almost lost by the engraver; but if you look closely at the far right of the picture, you may discern it. This picture was taken from a canal boat by Editor Taubeneck.

and for temporary invalidity lasting continuously for at least six months. The old age benefits are paid after the insured person has reached the age of 65 years.

The amount of benefit payments is determined by a specified formula entailing considerable arithmetic. The total amount of contributions is multiplied by 260, and the resultant product is divided by the number of weeks the insurance has been in effect. To the quotient of this division is then added 11.2% of the total amount of the contributions.

This final sum is the benefit paid to the insured employee, and it must be at least one-fifth the amount derived from the original formula.

For example, suppose that a man 41 years of age becomes incapacitated and, therefore, invalid. He has, let us assume, been employed continuously for 20 years, and his weekly contribu-

Accident insurance for manufacturing industries is very much the same as invalidity and old age insurance. The entire cost of payment is borne by the employer, and the compulsory requirements for both parties are similar to those of the invalidity insurance.

Weekly payments cannot be definitely stated in advance, but they are determined according to a yearly budget founded on an estimate of the needs. Naturally, they are variable in size.

The insurance accounts are handled by the State insurance bank, and the scale of payments is based on the hazards involved in the industry and on the actual earnings of the insured employee.

Whenever a worker is injured while on the job, the employer is required to provide immediate medical assistance, and he must present a report in duplicate and deposit it at the local

relatives of the deceased, is defrayed by the company.

Other provisions are that the widow shall receive 30% of the wages of her late husband until either her death or remarriage, that each legal child or stepchild shall receive 15% of the daily wage of his late parent until he is 17 years of age (if child is made orphan the payment is 20%, and if child is illegitimate but recognized by the deceased the same percentages and age limits hold good), and that the parents, grandparents, and parents-in-law of the insured shall, if they are living, receive some compensation.

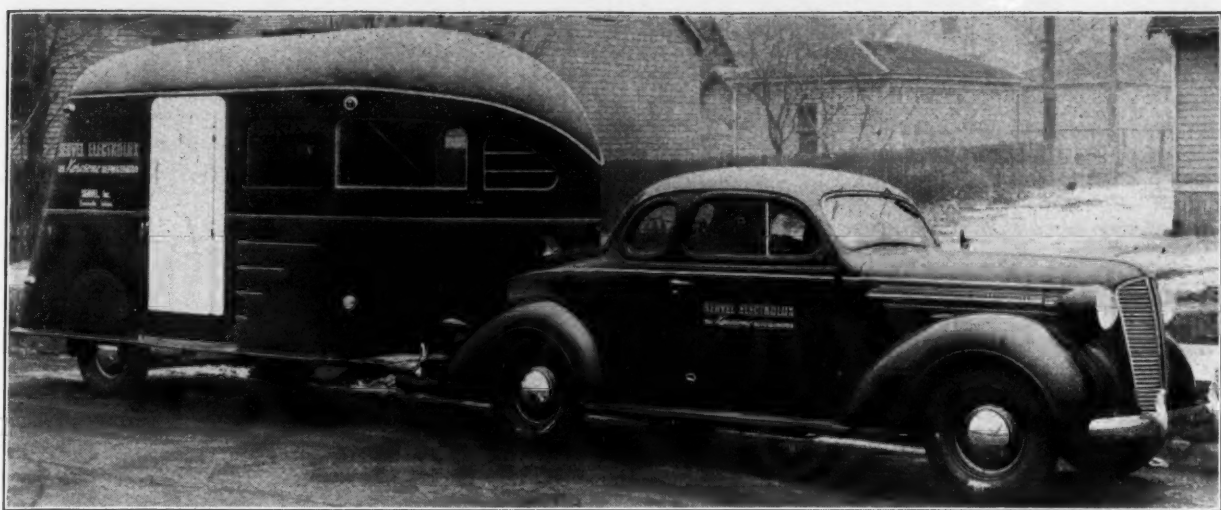
Agricultural accident insurance is for the most part the same as industrial accident insurance. There are, however, a few variances. The insurance is restricted to wage-earners in agriculture, cattle breeding, horticulture, and forestry. The State insurance bank and the State labor boards de-

Canal Boats Are Their Taxis, Buses, and Trucks of the Netherlands



In these four pictures, all taken in Rotterdam, one may see how important water is to commerce in the Netherlands.

Electrolux Takes Its Kerosene Unit to Rural Areas



Out beyond the power lines, where Servel has found a profitable market for its kerosene units, 100 of these Aerocar trailers have been equipped with an Electrolux refrigerator, radio, and loud speakers for demonstrations in rural territories. Salesmen have found this new mobile merchandise demonstration a potent sales-getter.

— HOW SUCCESSFUL DEALERS OPERATE —

Oklahoma Auto Accessory Chain Pays 15% Commission on Refrigerator Sales; Prospects Furnished by Users Lead to 50% of Sales

TULSA, Okla.—When a relatively small, independent, retail store chain steps out and does a gross retail volume of \$400,000 in a year on household electric refrigerators through 30 outlets in cities of which only two are in the 100,000 population bracket, it is pretty good indication there is plenty of direction and planning, and little waste in sales or sales promotion effort.

The Oklahoma Tire & Supply Co., with general offices in Tulsa, did that \$400,000 volume on 2,500 refrigerator sales in 1936, paid commissions of 15% or \$60,000, and spent 5% or \$20,000 for advertising.

And although the volume did not exceed the figure for 1935, it was the company's banner year because a ban was placed on short profit deals, and sales commissions were doubled on trade-in merchandise. This kept the stock clean and active throughout the year and resulted in the widest margin of profit realized in seven years of selling refrigerators at retail, declares Eli Sanditen, sales manager.

SATISFIED CUSTOMERS

The Oklahoma Tire & Supply Co., primarily an auto accessory business, entered the appliance field when Oklahoma law ruled the utility out of competition. The firm soon found competitors both plentiful and aggressive and perceived that every ounce of productivity must be squeezed out of every dollar spent for promotion and sales. At a time when everybody was reaching for the business the utility was forced to surrender, the company quickly learned the value of cultivating the satisfied customer.

So effectively has that been done that Salesmanager Sanditen traces 50% of his refrigerator volume to a system that obtains so many good prospects that salesmen need never solicit "cold." He maintains that his company evolved the best application of the "use the user" plan before it was embraced by a national manufacturer. For the Oklahoma Tire & Supply Co., it works like this:

CULTIVATING USERS

Within a reasonable length of time after the refrigerator is installed, the user gets a letter of appreciation signed by the president, M. Sanditen. With the letter goes a business reply card announcing a free award of one of a group of attractive premiums—or the equivalent of any merchandise of choice—to the user who sends in the name of a prospect to whom a refrigerator is eventually sold.

There is a 10% return on these business reply cards and 50% of the returns contain prospects that develop into actual sales—\$200,000 worth of refrigerator business, for example, in 1936, claims the sales manager.

But the satisfied user is not dropped there. If the contract is on the budget plan—and a majority of them are—the customer gets another letter from the president when the contract is closed out, and another return card. In between times the salesman has been to see the user, especially if the law of averages has not produced him the business he had a right to expect from that particular neighborhood.

there is a specialty supervisor whose sole duty is to assist salesmen.

In 1936 the company doubled the commission on trade-in merchandise and the result was highly gratifying.

Trade-in boxes moved out almost as rapidly as they came in, for salesmen no longer neglected the used article, because the new set-up enabled him to make as much commission as on a new box. And as far as the company was concerned, it reaped a reward of satisfaction in an inventory that showed an almost negligible stock of trade-in items, the best inventory in history.

So there is practically no turnover in the sales force, despite lack of drawing account, declares Salesmanager Sanditen, for the good salesman knows he can make good money.

\$300 MONTHLY INCOME

Incomes of \$300 a month are not unusual, but not derived entirely, of course, from refrigerator sales; and one salesman in a town of 15,000 population averaged about \$300 monthly for 1936. Result of this policy on commissions is that 90% of the 100 salesmen have been on the staff for two years or more, a number of them for the entire time the company has been in the appliance field. Newspapers, the radio, and bill-

But the best prospects will not result in business without active and able selling, Mr. Sanditen points out, so the company makes every effort to assemble and keep the best men in the territory.

COMPENSATION PLAN

Commissions are claimed to be higher than paid by competitors, there are six or seven major sales events each year with special inducements, there is the annual Christmas bonus event in which salesmen get an additional \$2 per cubic foot of refrigerator sold, and in key towns

boards, are advertising mediums used by the chain. D. Clements Sperry, advertising manager, explains that he not only follows closely the sales points developed by the manufacturer, but hammers away at those points consistently on the theory that advertising without a potential is wasted.

Each year the company anticipates a 20% increase in business and the 5% appropriation is based upon the resultant figure, with the advertising department striving to make 4 or 4½% do the job.

ADVERTISING COPY

All advertising is prepared in the general office and in the case of newspaper insertions, mats are distributed to store managers, who may change the date of insertion to suit local conditions, but may not alter copy or subscribe to any local promotion.

This centralizes control of the entire appropriation in the home office, from where newspaper insertions are scheduled as many as 65 times a month in the two cities of 100,000, and in proportion for smaller points.

A typical newspaper advertisement pushes the product first, but does not ignore the fact that other dealers have the same appliance, so Oklahoma Tire & Supply Co. copy must at the same time be institutional. It is done with a list of "Because."

TYPICAL ADVERTISEMENT

"The largest and most reliable home appliance dealer in the Southwest, because," says an advertisement, "we are a responsible concern with nearly 19 years of business experience to guide up; our entire capital stands behind every sale as your guarantee of satisfaction; we are the only dealer operating a complete service department manned by factory-trained men," and so on.

Eli Sanditen says the company could have sold a thousand more refrigerators last year, but instead they chose better deals and longer profit; and came through satisfactorily, with a happier, more prosperous sales force.

Modern Appliance Co. Opens Store in Greeley, Colo.

GREELEY, Colo.—The Modern Appliance Co. has opened a retail store at 919 Eighth Ave. here, to deal in household appliances. Members of the firm are Thornton Casey, Ray Fannin, and Stuart F. Bales. Mr. Fannin and Mr. Bales were formerly engaged in business in Phoenix, Ariz.

Recipe Books Form Key in Kelvinator Prospect Getting

DETROIT—The new prospect-getting plan, in which home economists representing Kelvinator distributors and dealers are assisting, revolves around the use of the Kelvinator Book of Recipes, copies of which are given to women's clubs, associations, and similar societies upon presentation of a coupon, redeemable at the dealer's store.

Details of the plan are as follows: the home economist and dealer contact women's groups, and the home economist explains the plan. In this way she puts across the idea that the association's members may obtain one of the Kelvinator recipe books (for which the dealer will give each of the members a coupon), by presenting the coupon and 25 cents at his store.

From the money received, 15 cents is refunded to the organization on every recipe book sold to a club member within a definite time. On this basis, the promotion not only increases the dealer's prospect list, but adds to the club's treasury as well.

Suggestions for carrying out the plan, made by the Kelvinator home service department, include supplying an extra quantity of coupons for club members who wish to give them to friends; specifying certain times during the day when members can redeem the books and during which the home economist can be present to demonstrate the electric refrigerator; and using leaflets published by the Temperature Research Foundation of Kelvinator Corp. when presenting the idea to club members.

Another suggestion is that the dealer arrange to have an Open House party to which club members are invited, and the money refunded from recipe books sold.

Deubell is Representative For Baltimore Utility

BALTIMORE—R. P. Deubell, formerly connected with the sales force of R. W. Norris & Co., Baltimore distributor of Stewart-Warner refrigerators and radios, has been appointed Eastern Shore sales representative for Baltimore Gas Light Co., distributor for Universal refrigerators in this area.

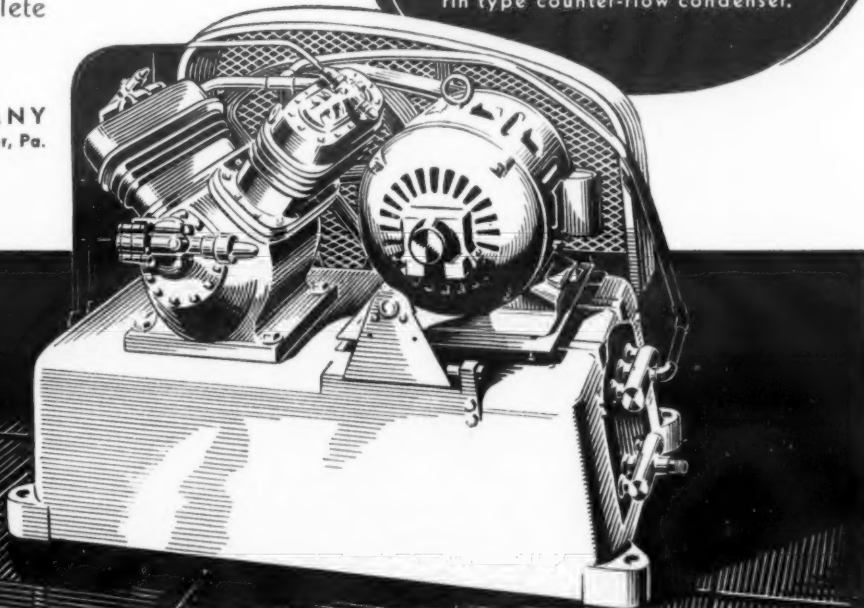
Prior to his association with the Norris company, Mr. Deubell had been general manager of the Eisenbrandt organization of Baltimore, former distributor for Majestic products.

BUILT TO SELL AND stay sold

Share in the widespread user satisfaction that is building business and good will for M & E dealers everywhere. There is an M & E unit for every refrigeration need—forty-five compressor models, from ¼ h.p. to 15 h.p.; water and air cooled; electric motor or gas engine driven. Complete details on request.

MERCHANT & EVANS COMPANY
Philadelphia, Pa., U. S. A. • Plant at Lancaster, Pa.

M&E
EST. 1866



**M & E
COMPRESSOR UNIT
A-24000 WF**

4-cylinder, 15 h.p., water cooled unit for heavy duty refrigeration and air conditioning service... forced lubrication... automatic belt tightener... counter-balanced Molybdenum Steel crankshaft... continuous fin type counter-flow condenser.

MERCHANT & EVANS COMMERCIAL COMPRESSORS

AIR CONDITIONING AND REFRIGERATION NEWS

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THEODORE T. QUINN, Assistant Editor
WINIFRED HUGHES, Assistant Editor
Departmental Editors

K. M. NEWCUM, Refrigeration Service
F. O. JORDAN, Air Conditioning
Staff Writers

WILLIAM H. LONG, ALFRED JONES,
JAMES MCCALLUM, and ROSS POTTER

R. T. CARRITHERS, Advertising Mgr.
HELEN K. GILMORE, Asst. Adv. Mgr.
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ROBERT P. NIXON, Asst. Business Mgr.
JEAN H. ADAMS, Subscription Manager
LOLA E. DEW, Circulation Manager
WINIFRED MERSON, Spec. Representative

Advertising Representatives
JOHN B. GALLAGHER CO., INC.,
11 W. 42nd St., New York, N. Y.
Pennsylvania 6-1380

LEWIS & NOELLE
612 N. Michigan Ave., Chicago, Ill.
Superior 8568

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Public Relations

TREATED to an evening which was unlike anything a great many of their number had ever experienced, distributors of York air-conditioning and refrigeration equipment attended a banquet last Tuesday night which was an object lesson in intelligent employee relations.

Plant foremen prepared the meal, and served it. An orchestra composed entirely of York employees, plus a crack glee club of the same composition, provided the music. These two organizations were trained and directed by York men, and they played and sang several original numbers written by York "amateur" composers.

After the dinner, the musical entertainment, and a speech by the editor of AIR CONDITIONING AND REFRIGERATION NEWS, the president of the company got up to introduce a flock of his executive assistants. Like President Shipley, most of these executives had risen from the ranks in the plant. Each man told how he started—at the bench, in the tool shop, designing, installing—told how many years he had been with the company, and expressed loyalty to the company and to friends and working companions.

25-Year Club

York has a "25-Year Club," consisting of men who have worked for 25 or more consecutive years for York (if an employee works, say, 23 years for York, quits for six months, and returns, he is not eligible for membership, but has to start all over again). Membership runs well into three figures, including many of the major executives. There are 30-year men, and 35-year men, and even a few 45-year men. Which should indicate something about the manner in which York's employee relations have been conducted down through the years.

No closed shop is the York factory. Labor troubles have been negligible. Agitators are allowed to come into the plant and tell their stories. Thus far the general answer to their organization attempts has been something like: "Phooey."

Two Guiding Principles

Two principles seem to be the guiding stars in the highly successful York method of handling employee relations. First is to create mutual fellowship, by means of organized recreations—like the glee club, the band, and athletic teams—in which executives play alongside of the men from the production lines. Second step is to build the worker's pride in himself and his company by making him feel important in the general scheme of things. The whole program is administered in a folksy, homespun, brotherly fashion.

Today the attention of the entire industrial world is focused upon the problems of employee relations because of the serious nature of the widespread strikes in General Motors automotive plants. As never before, stockholders and managements are thinking hard about the problems of getting along with their employees, treating them fairly, and winning their good will.

Fully as important is the necessity of enlisting the sympathy and good will of the general public.

Public relations, human relations, have suddenly assumed the important position in American industry which they have long deserved.

Long Neglect Penalized

Finance and management have just begun to realize that their attention to, and development of, public relations have lagged far behind their organization of production and merchandising. They see that they are being made the victims of well-planned attacks from many quarters, and that because they have too long neglected the matter of selling industry and business thinking to the country at large, those attacks have been unmeritedly successful.

A radical minority found in the confusion and bewilderment of the late depression the opportunity they had long been seeking: an opportunity to blacken the name of American business, to make the average American laborer and consumer acquire a vague feeling that he was being gypped by a bloated group of crass "economic royalists."

For the first time in American history, we are faced with the incubus of a class war. The American way of life is being threatened. Industry as such, and business men as a group, are being misrepresented and slandered before the public.

Gaining Confidence Through Becoming Confidential

There is but one answer to this problem, which is by all odds the most serious problem facing business today; and that answer is: Education. The public must be given an understanding of fundamental business philosophy. It should be informed about the problems which face management. Business must be humanized, must be interpreted in terms of human values.

It's a selling job of the first water, one which calls for experts in the business of interpreting, in

print, the thinking of specialists in language intelligible to the common man.

First requisite is a policy of frankness, a willingness to "open up" and take the public—and labor—into the confidence of management. The old policy of "get 'em young and tell 'em nothing" has no more place in today's scheme of things than the "public be damned" theory of the nineteenth century.

People are glad to trade with a man they know and like. They trust him, and come back to his store again and again, habitually. But an impersonal corporation is likely to be something else, to their way of thinking. If they can identify it with some particular man they trust, with some winning personality, then the big company becomes humanized to them; and they are not so apt to think of the big concern as being something cold and soulless, controlled by a few rich men who are waxing fat on excess profits wrung from the defenseless "common people."

Most Important Job

There is a great job ahead for institutional advertising, just as there is a great future for the man who knows how to kindle the fraternal spirit among employees. These are two avenues of endeavor which are generally foreign to the training and thinking of most industrial executives; the help of specialists must be enlisted.

But nothing else on the business docket today is half so important as "human relations."

- LETTERS -

How Much of the Industry Does the News Cover?

The Palmer Co.
Cincinnati, Ohio
Jan. 30, 1937.

Gentlemen:

Kindly advise to what industry you refer when you mention refrigeration. From the bulletins you have been sending us, we gather that this pertains to electric refrigerators and not to industrial ice-making and cold-storage.

Let us hear from you.

A. HONNIGFORD.

Answer: Attention is given to all applications of refrigeration and all branches of the industry. For example, the REFRIGERATION ENGINEER'S MANUAL, published serially in the NEWS and now available as one of the books of The Refrigeration Library, is designed for operating engineers in industrial refrigeration plants.

There has been less emphasis on ice making and cold storage than other subjects treated in the columns of the News for two reasons:

(1) Most of the real news in recent years has been made by other branches of the industry. There has been relatively little growth of the ice business. (2) Two or three publications have, for many years, devoted their attention almost exclusively to ice making and cold storage and, therefore, it has not appeared that there was a need for additional service in that direction.

Will Dealers Have to Combine to Survive?

Cline Electric Service
Fresno, Ohio

Editor:

Please find enclosed check for renewal subscription. I cannot get along without your paper.

I would like to hear of some method, whereby the independent dealer will be able to stay in the electrical appliance business in the future, and be able to make a reasonable profit.

I have been in the electrical appliance business at the same old stand for the past 12 years, starting with Delco Light and branching into sales and service for all household electrical appliances.

Within the last few years our new competitors, two of the well-known mail order houses have installed stores in Coshocton, our county seat; also, the local Farm Bureau have taken on a full line of light fixtures, and recently have taken the entire Westinghouse line of appliances.

The three above-mentioned companies are actively canvassing the new rural lines. The Farm Bureau does not cut the price outright, but sells the farmer on the idea that he will

be getting a cut price at the end of the year in the way of a dividend.

The mail order houses are under us in price on the entire line, and have sold more radios and washers in the rural territory in this county the past year, than all the independent dealers combined.

The factory field men tell us to stress quality above price, but in the past three years I have not had one sale closed by a field man, and furthermore do not see the need of field men to take our orders.

I am firmly convinced, if the independent dealers are to survive, they will have to get together and buy refrigerators, washers, etc., in carload lots direct from the factory, splitting up the load among themselves, buying for cash, and eliminating some of the middle men that are between the factory and local dealer.

CHAS. F. CLINE.

Now We Know Who Oscar U. Zerk Is

Oscar U. Zerk
Suite 633 Palmolive Bldg., Chicago
Gentlemen:

Feb. 4, 1937.

On Jan. 30, I have sent you a letter asking you to be so kind as to inform me immediately how many electric household refrigerators were manufactured in the United States during 1936 by each individual electric household refrigerator manufacturer.

In other words, I am not only interested in the total but mainly how each individual refrigerator manufacturer turned out during 1936.

You have elected to ignore my letter which I do not consider right. I am not only a subscriber of your REFRIGERATION NEWS and I have not only advertised for help many times in your paper, but in addition, I want you to know that I am the largest stockholder of the Stewart-Warner Corp. in Chicago. It may, therefore, pay you to treat me differently. I expect your answer by return mail.

OSCAR U. ZERK.

Answer: If we find out exactly how many household electric refrigerators were manufactured by each individual company during 1936, the information will be published in the NEWS, probably on the front page.

As has been explained, in answer to similar inquiries, most of the manufacturers furnish the records of their sales to the statistical department of National Electrical Manufacturers Association where the figures are compiled and the totals only are released. The sales of individual companies are not made public.

All statistics furnished by the association are published in full in the NEWS, appearing approximately once a month. The NEWS then makes an estimate of the sales by all other companies (not reporting to Nema) and these estimates have long been accepted as the official all-industry figures.

Readers have been reminded frequently that the complete statistical data showing sales of automobiles classified by makes, states, and counties, is made available because of the fact that every automobile is required to bear license plates when it appears on the streets. It is true that manufacturers of refrigerators are also required to pay a tax but unfortunately, from a statistical viewpoint, the tax law does not provide for an historical record of each unit.

We have to depend, therefore, upon such information as the manufacturers are willing to furnish about their own business. Due to the highly competitive conditions of the industry, most of the companies have not been inclined to furnish any too much data. The general tendency of sales departments is to exaggerate when statements are made regarding their own volume of sales.

It is true that information leaks out and that inquisitive executives often succeed in getting a pretty good line on the activities of their competitors. Information regarding purchases of parts and materials often provides a clue to the volume of the unit manufacturer's business.

Kelvinator Corp. is the only one of the large companies which makes official announcements more or less regularly regarding the number of household electric refrigerators shipped from its factory. Kelvinator is also the only large producer whose financial statements are of much value as refrigeration statistics. In the case of other large manufacturers such as Frigidaire, General Electric, Westinghouse, Norge, etc., refrigeration business is a department, or a subsidiary, and the financial operations affecting refrigeration are submerged or combined with other lines.

Recently some of the companies have made announcements at distributors meetings regarding sales during 1936 and sales executives have been talking rather freely, and with apparent assurance, regarding the 1936 total sales of their principal competitors. We have not felt justified in publishing such figures until the information becomes more definite and dependable.

Now referring to your complaint regarding our lack of promptness in answering your inquiry, we regret that we cannot meet all of the de-

mands of our subscribers for special services. The handling of correspondence is one of the greatest problems in our office and one of the most difficult to solve. We receive a tremendous quantity of mail and we have excellent facilities for handling all regular and routine business but the requests for information are so varied that the work cannot be translated into office routine.

We now have about 60 employees on the payroll in Detroit, which is probably as large a staff, or larger, than that maintained by any business paper in the country. Obviously, most of these employees do not have the training or experience to enable them to answer such questions as you (Mr. Zerk) have asked.

Members of the editorial and advertising departments who are constantly traveling and calling on the trade and who are, therefore, best equipped to answer inquiries regarding conditions and trends in the industry, are away from their desks for days, and sometimes weeks, at a time. When they return to the office they invariably have pockets full of notes which must be turned into news for publication in the current issue. The job of "getting out the paper" takes precedence over everything else. Requests for free service, even from the "largest stockholder of the Stewart-Warner Corp. in Chicago" sometimes have to wait.

Incidentally, Mr. Zerk, perhaps you should let us know how many of the 1,200,000 shares of Stewart-Warner stock you own so that we may know just how high to jump the next time you crack the whip.

Electrical Ratings Wrong In Ranco Control Story

Ranco, Inc.

601 W. Fifth Ave., Columbus, Ohio

Editor:

We thank you for publishing the announcement of our new control, especially for space on the front page. Therefore, we regret that we must call to your attention an error in the electrical rating which appeared on the front page.

One of the important and outstanding features of the type KO Ranco Commercial Control is its electrical rating of ¾ hp., 110-220 volts, a.c., and ½ hp., 115 volts d.c. (please refer to the enclosed copy of Bulletin No. 690). The error in your announcement was in both the a.c. voltage, and in the d.c. hp. rating.

J. D. MERKLE,
Asst. Sales Manager.

Evansville Firms Escape From Damage in Flood

Hoosier Lamp and Stamping Corp.
Evansville, Ind.

Editor:

In this week's ELECTRIC REFRIGERATION NEWS I noticed an article concerning both the Servel and Crosley situations which have arisen from the Ohio River flood.

I feel that it would be most helpful to us if you would kindly print a notice to the effect that our plant, equipment and materials all survived the flood in good shape.

While the situation in this city has been most terrible, the plants serving the refrigeration industry, namely, Servel, Sunbeam Electric Mfg. Co., and ourselves, were all fortunate in their locations. We were closed by martial law, and by the inability of our personnel to reach their work, also by discontinuance of our water supply.

Under military permit we were all permitted to resume operation yesterday, and since our water supply is again restored and our personnel re-established, we are now in full production once more.

We will greatly appreciate an article to this effect in your next issue.

C. NELSON SMITH,
Vice President.

What! No Romance?

The Canton Hardware Co.
1221 Third St., N. E., Canton, Ohio
Mr. George F. Taubeneck:

Having read with pleasure your very illuminating travel tales. Having also listened with relish to your little talk the other evening to the York distributors; I am constrained to make a suggestion: That you publish this interesting account in book form. I predict that it would enjoy a wide market within the refrigeration market and in the national market as well.

Richard Haliburton and Harry A. Franck for romance, Taubeneck for interesting and useful facts.

J. W. BROTHERS.

Refrigeration Books

720 Bellaire Ave.
Dayton, Ohio

Dear Sirs:

It is my understanding that you publish books dealing with refrigeration and air conditioning. I would like for you to send me a list of the books and prices.

Perhaps you could also inform me as to how I could proceed to get into air-conditioning installation and service work. I have had five years commercial refrigeration service work.

CARL D. BOWER.

Frigidaire No. 4,000,000



The 4,000,000th Frigidaire a few minutes after it came off the end of the assembly track at Frigidaire's Moraine City, Ohio, household refrigerator plant. It's a deluxe, all porcelain super-duty 7-cu. ft. model. Left to right, W. F. Armstrong, assistant general manager; David K. Banker, comptroller; E. B. Newill, chief engineer; and E. G. Biechler, general manager.

- DEPARTMENT STORE NEWS -

Remedy for Predatory Price Cutting Is Not Price Fixing, Weil Tells Dry Goods Association

NEW YORK CITY—"Price fixing is not the remedy for predatory price cutting. The remedy will be found through fixing a base below which price cutting shall not go and thus limit loss, but permit free competition above such a base. Loss-limitation, which is not embodied in any of these laws, is an adequate and sufficient solution for the evil."

This was laid down as the credo for department stores on legislative attempts on price fixing, in an address before the recent annual convention of the National Retail Dry Goods Association here by Frank L. Weil of Weil Gotshal & Manges.

Said Mr. Weil, with respect to current legislative trends:

FAIR TRADE ACTS

"If I were asked to name the single most significant legal decision to retailers in the last year, I would name the decision of the Supreme Court upholding the constitutionality of the Illinois and California Fair Trade Acts, which permit manufacturers to fix the resale price of trade-marked articles and which bind third persons to the maintenance of such prices."

"If I were asked to name the single most significant piece of legislation to retailers in the last year, I would name the Patman Act."

"The Illinois Fair Trade Act, which has been sustained by the United States Supreme Court in the Old Dearborn Distributing Co. case, and the California Fair Trade Act, which has been sustained by the United States Supreme Court, result in direct price-fixing."

"These laws permit the owner of a trade mark to stipulate the resale price of the article bearing that mark so long as it continues to bear the mark."

"This places an entirely artificial value on the article, together with the elimination of competition in its distribution. By reason of the Supreme Court decision, it is today the law of the land, but I call upon retailers to demonstrate that it is bad economics."

"General Grant, in his inaugural address in 1869, stated: 'I know no method to secure the repeal of bad or obnoxious laws so effective as their stringent execution.'"

"Two consequences of these resale price maintenance laws will be the encouragement of private brands and the need for the enactment of more stringent truth in advertising laws."

"In New York, the Court of Appeals has held the state Fair Trade Act unconstitutional in so far as it attempts to bind third parties. This decision is not appealable to the United States Supreme Court. The

Court of Appeals in a recent argument has been asked to reverse itself in order to bring its decision into accord with the Supreme Court."

"Senator Tydings last year introduced in Congress a Bill which would permit resale price maintenance contracts in interstate commerce. In view of the Supreme Court decision, it is quite possible that such a law may be enacted at the present session of Congress."

TRADE MARK IMPORTANT

"The Duffy-Vandenberg Bill, providing for design registration, passed one house of Congress last year, but failed to pass the other. It will undoubtedly be reintroduced this year and will carry with it greater significance because of the Supreme Court decision with reference to the Illinois and California Fair Trade Acts. The Supreme Court has given a value and a property right to a copyrighted trade mark. It is not inconceivable that the same protection may be extended to registered designs, and if this takes place, the consequence may be that merchandise, the design of which has been registered, may likewise be subjected to resale price maintenance contracts with a further restriction on the freedom of retailers in competition."

"A number of other so-called price maintenance laws have been enacted in various states. In California, an Unfair Practices Act has been enacted prohibiting the sale of goods at less than cost, and defining cost as total cost including materials, labor and overhead. The law has been sustained by the California Courts, but has not yet been passed upon by the United States Supreme Court. It is certainly a direct price-fixing law."

RETAIL DRUG ACT

"In Connecticut, there has been enacted a Retail Drug Act, which prohibits the sale of drugs below the manufacturer's wholesale list price per dozen or per unit. This law has not even been accorded the respect of challenge in the courts and it is undoubtedly unconstitutional."

"I should like to point out to you what I believe to be the basic vice in these types of legislation. Practically everyone is agreed that predatory price cutting aimed at a competitor should be outlawed. This is the evil sought to be remedied."

"But these laws do not reach the evil. They propose to burn the building down to get rid of the rats and in their train they bring a host of new evils. These laws inaugurate price-fixing which throughout time has been proven unwise and uneconomic."

"The Patman Act, while not a price-fixing law, inevitably will affect the price structure. While some of the objectives of the Patman Act are undoubtedly sound, many of them are clouded with obscurity and others run far afield."

"The United States Chamber of Commerce has recently petitioned Congress to suspend that provision of the Clayton Act which permits the institution of an action at law to recover triple damages for discrimination under the Patman Act until such time as the Federal Trade Commission and the Courts have been able to enlighten the public as to what the Act means. Such a result would be highly desirable until there can be an adequate comprehension of the effect of the Patman Act."

"Some 11 complaints have already been issued by the Federal Trade Commission under the Patman Act. If these complaints are sustained, it is readily apparent that serious interference will result to time honored practices in the manufacturing industries and in the distributive trades."

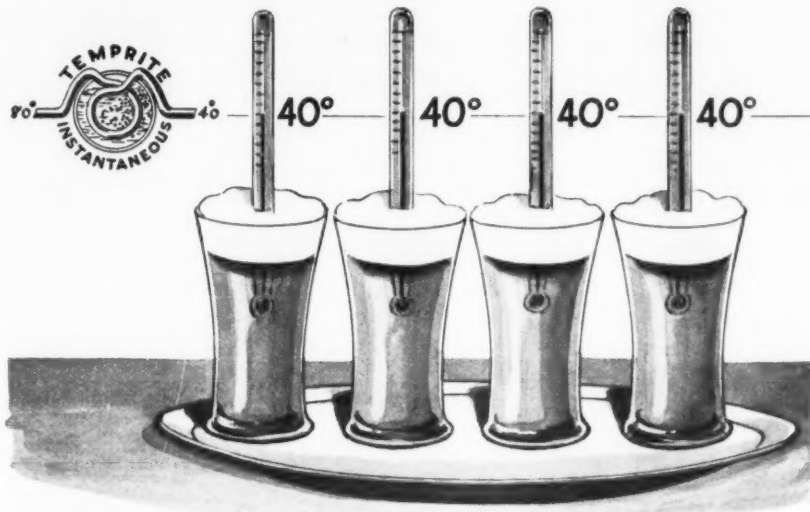
"Representative Patman has prepared a model state law for submission to the various state legislatures, whereby the various states would adopt counterparts of the Patman Act. He has also proposed that there be enacted both by Congress and by the states, laws prohibiting a manufacturer from engaging in the retail business, although recently he has given indications of limiting the scope of this law so as to provide that the Federal Trade Commission may restrain a manufacturer from selling at retail only in those cases where the consequences would involve unfair competition."

TEMPRITE assures

Forty degrees Fahrenheit is the best temperature to serve beer. When you use a Temprite for cooling, every glass of beer you serve will be 40° or within one degree of that temperature, regardless of the weather or how fast you draw.

40° BEER

Write for illustrated folder B-1

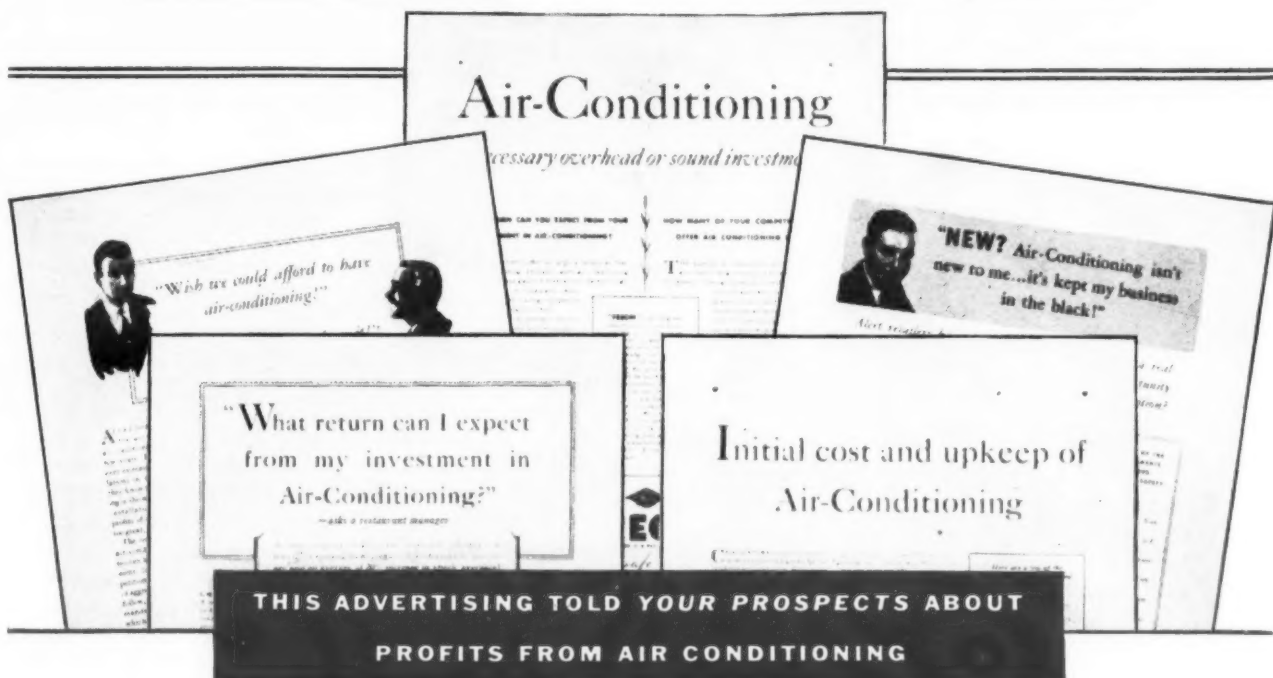


TEMPRITE PRODUCTS CORPORATION

1349 East Milwaukee Ave., Detroit, Michigan

ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

Facts that make Customers out of Prospects



THIS YEAR we are bringing the story of safe, efficient, profit-making air conditioning to new thousands of your most important customers. With the addition of TIME magazine to our schedules, promotional advertising sponsored by the manufacturers of "Freon" safe refrigerants will appear in publications with a combined circulation of over 685,826. We invite you to make use of our advertising in your selling efforts, and to call on us for any further assistance we can give.

"Freon" refrigerants are used in 99% of all mechanically cooled railroad cars, in schools, hospitals, factories, mines,

restaurants, hotels, stores—wherever human safety requires maximum protection. They are non-poisonous, non-flammable, non-explosive, odorless. They have no harmful effects on foods, clothes, furs or flowers.

"Freon" refrigerants have been tested by the U.S. Bureau of Mines, and meet all the requirements set by the Underwriters' Laboratories of Chicago in their report "Standard for Commercial Refrigerating Systems" (Subject No. 207).

It is a service to yourself, to your customers, and to the industry to provide your cooling system with one of the safe "Freon" refrigerants.

KINETIC
FREON
REG. U. S. PAT. OFF.
safe refrigerants

SOME OF THE IMPORTANT GROUPS WHO WILL BE REACHED BY OUR PROMOTIONAL AIR CONDITIONING ADVERTISING IN 1937:

- Architects
- Builders
- Building Managers
- Chain Store Executives
- Contractors
- Department Store Executives
- Engineers
- Executives
- Hotel Managers
- Office Managers
- Restaurant Managers
- Retailers

and many allied groups, representing the cream of your 1937 prospects.

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

QUESTIONS & ANSWERS ABOUT THE RED BOOK

Q.—What is the Red Book?

A.—This descriptive title has been adopted, for the sake of brevity, to designate the "1937 MASTER CATALOG OF AIR CONDITIONING AND REFRIGERATION EQUIPMENT, ACCESSORIES, PARTS, MATERIALS, SUPPLIES AND TOOLS," which is being compiled by Business News Publishing Co. for free distribution to active and prospective buyers in all branches of the industry.

The Red Book is being issued in response to a new need of the industry due to the general improvement in business which has brought a great many new dealers into the business, a wide variety of new products on the market, a sudden and widespread public interest and, consequently, a pressing demand for detailed information about the merchandise which is now available for sale.

Q.—When will the Master Catalog be issued?

A.—The initial Deluxe Edition of 5,000 copies will be issued in March and will go to a specially selected list of manufacturers, distributors, jobbers, contractors and independent service companies who have made written requests for the Master Catalog. Other editions, details of which will be announced later, will be issued until complete coverage of the entire market has been effected. We estimate that a total of 50,000 copies will be required.

Q.—What will the Red Book look like?

A.—The Deluxe Edition will have expensive, heavy, paperboard covers with a patented metal ring binding which permits the book to lay flat when opened at any page. Each sheet is, in effect, a separate insert. Advertisements will be printed on heavy coated stock (70 lb.). Those who furnish their own inserts may use bleed borders, any number of colors and any kind of paper stock desired (up to 80 lb. weight) at regular space rates.

Q.—What is the cost of inserting a full-page advertisement in 50,000 copies of the book?

A.—The rate for the total circulation of 50,000 copies is \$500 per page. That amounts to one cent per page per copy which is the minimum amount it would cost you for postage alone to make any kind of a mailing. There is a reduction in the rate if you use a total of 2, 4, 8, or 16 pages in the MASTER CATALOG, the DIRECTORY or any of the Manuals to be published during 1937.

Q.—What will it cost for a page in the Deluxe Edition only?

A.—The page rate for the Deluxe Edition of 5,000 copies is \$100. That amounts to 2¢ per page which is scarcely enough to cover the cost of printing, addressing, and postage for the simplest piece of direct mail—even if you had a picked list of good prospect names available.

Q.—May we insert 5000 copies of our regular catalog in the Deluxe Edition?

A.—Your standard catalog, booklet or leaflet may be bound into the Master Catalog provided the page size is 8½ x 11 inches or smaller. Since the patented metal ring binding of the book will accommodate such a variety of material, it will be necessary for us to have a sample copy of your literature in order to quote an exact price for including it in the book. Thus if you have an 8-page booklet of small size and printed on light-weight paper, it will cost less than 8 full-size pages printed by us on 70-lb. stock. You can depend upon it that customers and prospects will keep the big Master Catalog in which your booklet is permanently bound and conveniently indexed.

Q.—What advantage will there be in inserting our catalog in the Red Book instead of mailing it separately?

A.—IF you have gone to the expense of building up a really good mailing list and have kept it up to date so that you feel sure that it includes the names of all the new companies which have come into the field, and IF your company and products are sufficiently well known that you can depend upon customers and prospects to keep your catalog where it will always be available, and IF you can afford to furnish a well-bound book of sufficient size that it will not be easily lost or mislaid, then it may be just as well for you to depend upon your own facilities.

However, if you have not spent considerable money for filing cabinets, addressing and mailing equipment, and if you have not spent many thousands of dollars collecting and compiling prospect records from a great variety of sources, and if you do not have extraordinary facilities for keeping in touch with the rapid development in the refrigeration and air-conditioning business, and if you have not made

numerous test mailings to your various lists so as to weed out the names of those who have gone out of business, moved to another address, and others of no value—then we believe that a little figuring will demonstrate to you that the Master Catalog will not only be far more effective but also much more economical than any other method of distributing catalog information at the present time.

Q.—What is the difference between the 1937 Master Catalog and the 1937 Directory?

A.—During past years we have published several editions of the "REFRIGERATION AND AIR CONDITIONING DIRECTORY." The last one appeared in 1935 and a revised edition is now in course of preparation.

The DIRECTORY will contain the listings of all manufacturers, large and small. There is no charge for the listings, but the book will be sold for \$3.00 per copy. The circulation is, therefore, limited to those who are willing to pay the price to get complete information regarding all sources of supply.

The DIRECTORY is recognized as a very valuable service to the industry and it is constantly used by all large buyers. The DIRECTORY reaches a very important portion of the market but there has been a growing demand for some medium which will cover the entire market, including thousands of dealers whose refrigeration business is more or less incidental to other lines of merchandise.

There has also been a growing demand for some organized method of distributing catalog information to the thousands of new concerns which enter the business each year and who are active prospects for a great variety of products. The general upswing of business, the remarkable revival of the commercial refrigeration business, the active growth of independent service companies, the great expansion in foreign trade opportunities, and the big unknown market for air conditioning—these and numerous other factors have greatly accentuated the demand for immediate and wide-spread market coverage.

Q.—Isn't the Red Book just another scheme to sell some more advertising?

A.—If we could have our way about it, we would rather have the available advertising in the NEWS, the DIRECTORY, and the Manuals rather than going to so much trouble to develop a new book. We have undertaken the job of providing all the services required by the industry which can be done best by an independent organization. New conditions have made a demand for a new service.

This initial edition will undoubtedly cost us more than the total advertising revenue, just as the first edition of the DIRECTORY cost about \$10,000 more than the total advertising receipts. We broke even on the second edition and made an operating profit on the third.

We simply had to get out a DIRECTORY to meet the demand for information needed by buyers. Our office was being swamped with inquiries. We could not keep repeating in the columns of the NEWS, information which had already been published several times. We certainly could not write individual letters in answer to all the requests.

Similarly, we produced the MARKET DATA BOOK and although that operation has never been profitable, it was obviously necessary to supply the facts and figures. The sale of books partly offset the expense of collecting information which we had to have anyway.

Q.—Then why are you bringing out the Red Book if it may not be profitable?

A.—During the past year we have had a steadily increasing demand for mailing lists. Manufacturers who advertise regularly in the NEWS, the DIRECTORY, and other books which we have published, also concerns which have never advertised, have been pleading for lists and mailing service and wanting to know why we cannot furnish them.

At the same time, we have been getting an appalling volume of inquiries from all manner of companies and individuals wanting all sorts of detailed information regarding suppliers and products. A surprisingly large number of these inquiries have been coming from non-subscribers—people we never heard of before. It has become increasingly evident that the market has suddenly expanded in all directions. Obviously, we had to do something about it. The plan for the Master Catalog is our answer to the problem. Taken all together the program is elaborate and somewhat complicated. All of the details cannot be given here.

Simon Gets Washington Franchise for Hotpoint

WASHINGTON, D. C.—Simon Distributing Co., Motorola radio distributorship headed by James Simon, has been appointed distributor in this territory for the Hotpoint line of major appliances.

The Simon Co., with headquarters here, has a branch in Richmond, Va., and will soon open a branch at 1305 Cathedral St., Baltimore. William Cohen, connected with the company's headquarters for the past several months, will manage the Baltimore store.

Kelvinator Names Staff To Aid Utility Sales

DETROIT—Silas A. Kelsey, George Eastman, Thomas Craig, Jack Moore, and Edward L. Ellis have been appointed by Kelvinator division of Nash-Kelvinator Corp. to cooperate with public utilities in extending the use of electrical service to the public, according to Cambell Wood, the corporation's director for public utilities. These men will work directly with the operating companies in the field in accordance with the plans and policies recently announced by the corporation.

— FOREIGN TRADE NEWS —

'Frigoplate' Invented By Dane, Finds Favor In Europe's Markets

AMSTERDAM, Holland — "Frigoplate," the refrigerated display slab gaining wide-spread attention in European commercial circles, was introduced to the market by Carp & Co.'s Handelsmaatschappij N. V., a firm with headquarters here, which sponsors, pioneers, and sells the patent rights on mechanical inventions to independent manufacturing firms.

Invented in 1933 by Ingvarsdan, a Danish inventor, the Frigoplate was introduced by Carp & Co., who since have arranged for and control its merchandising in 40 countries.

Designed so that the equipment can be connected to any refrigeration unit, the Frigoplate can be automatically adjusted to cool any perishable foods placed upon it. Similar to an ordinary display counter in having no glass cabinet or cover, the Frigoplate can be made available in any size, form, or design. It is suitable for use in meat and fish markets, restaurants, butcher shops, pastry shops, and bars.

400 IN COPENHAGEN

Illustrating the successful reception which Frigoplate is receiving in markets where it is merchandised, J. R. Carp, head of Carp & Co., reports that there are more than 400 Frigoplate installations in Copenhagen alone.

The unit is being marketed in the United States by General Electric Co. under the name "Polar Plate," with the units being manufactured by Russ Soda Fountain Co., Cleveland.

One of the largest installations of Frigoplate equipment in England (where Frigidaire, Ltd. is sole concessionaire for the product) is that in the Billingsgate fish market, operated by J. Bennett (Billingsgate) Ltd.

GLORIFIED FISH MARKET

Modern inside and out, the Bennett market offers a glorified setting for the sale of fish. It has a curved, cream-painted frontage, with a wide, chromium outlined entrance, topped by a blue neon sign.

Six Frigoplate counters of various sizes are used to display the fish. The counters have black glass sides and thin silver chromium-plated copper panels.

Temperatures on the frozen fish display slabs are kept constantly at 40° F. Largest of the units in this installation is a slab 12 ft. long by 5 ft. wide, specially designed to fit into a wall recess. This counter is used exclusively for showing Greenland halibut.

Three other units of standard size (7 ft. 6 in. x 3 ft.) are used for showing other types of fish. A circular slab, used to display frozen salmon, centers the store.

The units are refrigerated by three 5-hp. compressors, which are located in an adjoining room. A 50-ton cold storage room below the fish market is used for storing fish not sold during the day, or for stocking a larger supply than that needed for one day.

Compressors for the installation were installed by L. Sterne of London and Glasgow, while the basement cold storage room was installed by J. & E. Hall, of Dartford, Kent.

ICE CREAM VENDER

Second product in the refrigeration line put out by Carp & Co.'s Handelsmaatschappij N. V., is the Carpomatic ice cream vending machine, refrigerated by dry ice. Consuming only 7 lbs. of dry ice in 24 hours, the machine need be re-filled only once in 36 or 48 hours, its manufacturers claim.

The Carpomatic cabinet has a capacity large enough to hold 175 ice cream bricks. The purchaser inserts two pennies in a slot and receives his ice cream from another slot. The unit was developed under the supervision of Prof. Dr. W. J. de Haas, head of the Kamerlingh Onnes Laboratory in Leyden, Holland.

Manufacture and sales of these units in the United States, according to Mr. Carp, is to be handled by a subsidiary company of Carp & Co.'s Handelsmaatschappij N. V.

Kelvinator Distributor in Porto Rico Expands

SAN JUAN, Puerto Rico—Insular Products Co., local Kelvinator distributor, recently christened its new and modern showrooms with a complete display of electric refrigerators, beverage coolers, and ice cream cabinets.

Citing the Meter-Ator plan as an effective sales tool in Puerto Rico, Murray Orinstein, manager of Insular Products, attributes a large portion of Kelvinator sales volume to the use of this plan.

A well trained personnel and effective floor displays have also materially aided sales, declared Mr. Orinstein.

Opening of the new showrooms was announced by a full page advertisement in *El Imparcial*, local newspaper. This ad, profusely illustrated, described the "originality and artistic distinction" employed by the company in emulating appliance salesrooms of the United States and Europe.

Crosley Refrigerators Used by Belgian Congo Rulers

LEOPOLDVILLE, Belgian Congo, Africa—The Governor General of the Belgian Congo and the "Commissaire de Province," the colony's second-ranking official, own Crosley refrigerators, according to A. G. Lindsay, manager, export department, Crosley Radio Corp.

Crosleys are used also by the colony's leading hotels, especially in Leopoldville and Matadi, and on a fleet of river steamers trading up and down the Congo.



Swing OVER TO
Coolerator
The Air Conditioned Refrigerator



You pocket all the profit on every Coolerator sale—instead of squandering it on repairs. For this modern refrigerator has no machinery or moving parts to get out of order... never plagues you with service problems.

Exclusive features make it easy to sell Coolerator: air conditioned—washed, humidified, circulated cold air... "Fresher foods at half cost"... ice cubes in five minutes.

Backed by strong national advertising, already more than a quarter million Coolerators are now in use. They range from the compact 2½ cubic foot model to the huge 50 cubic foot commercial type. Prices start as low as \$39.75. It will pay you to write today for all the facts.

The Coolerator Company
Duluth, Minnesota

Princess Kropotkin to Address Westinghouse Conference

MANSFIELD — Princess Alexandra Kropotkin, internationally known linguist, author, and lecturer, is among the speakers who will address the Second Annual Home Service Conference and Kitchen Planning School being held at Westinghouse Electric & Mfg. Co. Wednesday, Thursday, and Friday of this week.

Other speakers on the three-day program include editors of leading women's magazines and utility representatives. Approximately 200 home service workers from all over the country are expected to attend the conference.

New developments in kitchen planning, methods of demonstrating new equipment, and other phases and prob-

lems of home service work will be covered in both formal sessions and open forum meetings in the conference program.

Short Gets Exclusive Houston Franchise for Kelvinator

HOUSTON, Tex.—W. W. Short, pioneer electric refrigeration dealer here, has been given an exclusive franchise to handle Kelvinator products in this city.

During the 13 years that he has been in refrigeration here, Mr. Short has built up an extensive sales and service organization.

The Kelvinator line will be shown at the dealership's display rooms at 3108 Main St. and at 801 Capitol Ave., and at two additional showrooms to be opened later.

floor, and one way to get our copywriters down on the floor is to make them go after copy and dig into the merchandise and talk to salespeople and customers for the facts. It wouldn't hurt them to sell once in a while, too. Our copywriters should act as a trained staff of merchandise news reporters as well as word-mechanics. We will increase the news value, the sharpness and timeliness of our picture if we do this.

FACTS FOR CUSTOMER

"Having set up the machinery for news-gathering, let's use the information we garner. Give the customer facts. I don't mean that we have to become too technical. Nor do I recommend taking all the drama, the romance, the sell out of sales promotion. But isn't it a fact that we too often ignore facts and workman-like selling in favor of an unusual layout or a 'smart' approach and tricky copy?

"Most of us too often look for looks and not for vitality in our advertising and promotion. We need to be more critical of the way we are presenting our story—of the approach—even if the looks of our efforts must suffer slightly as a result. Copy is the 'exchange medium,' and the layout and type constitute the vehicle for the message. If these are built on nothing but imagination, we have created only a way to waste advertising money. Let's not advertise or promote just because we 'have to do something.'

EFFECTIVE PROMOTION

"We need to think of sales promotion in terms of more than just newspapers, direct mail, radio, and the other old stand-bys. We're sure not to neglect them. But there are other ways to achieve more effective sales promotion. Here are just a few of them:

"Point of Sales Presentation. This activity is vital to the success of any sales promotion scheme. We sales promoters often complain that 'we bring them into the store, but you don't sell them when they're in.' Much of the fault has been ours. We have been lax about the treatment of our signs. We have been indifferent about department displays—cases, counter displays, ledge displays, wall cases. We have given all our attention to the showy things, windows, shops, splashy interior treatment. We need to pay more attention to the unspectacular point at which the customer 'signs on the dotted line.'

"I recommend that someone in each of our organizations be made definitely responsible for point of sale presentations. This person should see that selling assortment displays are created, that enough and well-worded signs are used where they are needed, that cases are kept looking new and fresh, that every display tells a story, that interior displays tie up with windows and with advertising.

"Selling Price Tags, Adequate Labeling, Booklets. You know how much the customer can glean from the average price tag. If the salesperson happens to be busy, the customer must wait until she can be waited on, when she might be half sold from the right kind of tag by the time the salesperson gets to her.

"Many types of merchandise can carry a sticker telling this selling story. Where neither the sticker or the tag is practicable, a leaflet or booklet can be used. Perhaps some of these selling helps can be paid for out of direct mail money that is not producing as it should. Or some of those exhibits and lectures we had which cost us money and to which we had to send our people to make an audience, can be discarded and the money used this way. It is worth while investigating, and should be made part of the sales promotion program.

"More and Better Information for Salespeople. It is a simple and very inexpensive matter to get extra copies of printed matter, or tear sheets from the newspaper, or what have you, for distribution to the store staff so that everyone will be more promotion and fact-minded. Customers appreciate being able to get information about activities anywhere they ask for it.

"We need to do more work with buyers, to see that they follow through properly on their promotions. We should help give their salespeople all the information possible about merchandise and promotions. Of course the buyer knows all about the merchandise, but he very often doesn't know how to pick the important information for sales promotion purposes. That's our job—to be done in cooperation with the training department and the buyer."

EEL, Nema Launch National Drive to Secure Public Acceptance of Electric Water Heating

CHICAGO—Plans have been completed by Edison Electric Institute and the electric water heating section of National Electric Manufacturers Association for an intensive promotion to secure broader public acceptance of electric water heating utility companies in 1937.

The program is the first planned national drive ever undertaken on electric water heating on a cooperative basis among manufacturers, and is the result of the advances which this comparatively new electrical appliance has made during the past few years. Sales of electric water heaters reached a total of 104,000 in 1936, an increase of 48% over 1935.

Manufacturers feel that the electric water heater is in the same position today as the electric range occupied five years ago.

Heading the joint activity is Kinsey M. Robinson, president of the Idaho Power Co. and chairman of the EEI water heating committee. Idaho Power Co. has a saturation of 20% of electric water heaters in its territory, and one of Mr. Robinson's chief activities will

be appearances before utility companies and industry meetings, to outline the experience of his company and the industry and Electric Water Heater Bureau's plans.

The Chicago office of Maxon, Inc., under the direction of L. J. Sholly, vice president, will supervise activities. A plan book on the joint EEI and Nema activity, now in preparation, will outline the objectives of the joint activity, and tell the complete story of the electric water heater as a load builder. A news information service will be also established to point out the many uses of hot water.

Cooperating with Mr. Robinson as head of the EEI water heating committee are these manufacturers:

Automatic Electric Heater Co.; Clark Electric Water Heater Division of McGraw Electric Co.; the Cleveland Heater Co.; Edison G. E. Appliance Co., Inc.; Electromaster, Inc.; A. J. Lindemann & Hoverson Co.; Westinghouse Electric & Mfg. Co.; John Wood Mfg. Co., Inc.; the Hotstream Heater Co.; Malleable Iron Range Co.; and Thermogray Co.

— PROFITABLE SALES METHODS —

Sales Promotion Manager Must Achieve Customers' Viewpoint, Says Posen

NEW YORK CITY—The sales promotion manager can be most valuable to his store by achieving and keeping the customer's point of view, E. Lewis Posen, Hochschild, Kohn & Co., Baltimore, told the sales promotion division of National Retail Dry Goods Association in a speech last week on "Insuring Proper Results in Sales Promotion."

"There are enough people in every store who will worry about the strictly technical side of the business—the store's side of the picture," Mr. Posen said. "But not enough of us think first of the customer, and then of the store."

CUSTOMER'S REPRESENTATIVE

"We must be the customer's representatives. Stores need to have us to protect the customer's interests, as against those of the store. It makes for a more intelligent presentation to the public of the facts it wants to know."

With all due respect to some inspired stores, and to some inspired copy from all stores, much advertising is of what is bought rather than of what should be advertised, Mr. Posen said.

"And I believe it is part of the sales promoter's job to help determine what shall be bought and advertised by a thorough and constant analysis of customer demand," he added.

"We in the average store spend hundreds of thousands of dollars on newspaper space, air time, paper and printing for direct mail, postage and such. But we balk at spending a very small part of the appropriation to find out what papers our customers read and how and why they read them—what kind of message they will give audience to in the day's mail—what they want to hear on the air. We seldom check to see who our

customers are, and why they shop or no longer shop in our store. And we make practically no real attempt to find out why our customers buy, what they would like to buy, what they would like to pay—how they live, or how they think.

"We don't begin to find out what happens after the ad runs. Too often we accept a guess instead of an actual count or a well-founded opinion. We don't make adequate traffic counts. We don't make a thorough analysis of the way people buy in our stores, and why they buy the way they do.

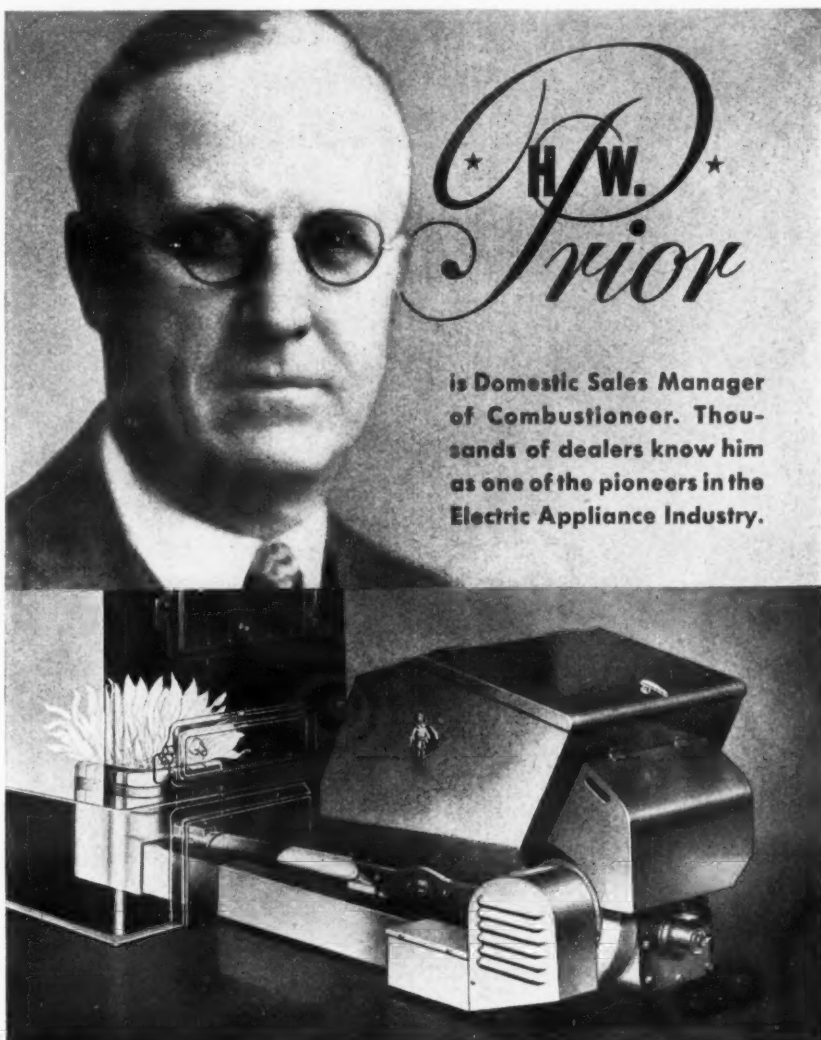
SCIENTIFIC FOOTING

"It seems to me that an effective sales promotion organization from now on must include some provision for putting our operations on a more scientific footing. I don't expect sales promotion ever to be an exact science. But we do need to spend a very small part of the budget for the better spending of the total.

"Let's look at our organization to see if we have the right people or enough of them. We should determine whether we are giving our good creative people enough encouragement, and whether we are hemming them in with hide-bound restrictions or giving them a chance to develop their talents to the fullest for our benefit.

"Let's not keep our people at a desk all day long. We should encourage them to write, to draw, to study. They ought to attend luncheons, fashions shows, clinics, women's club meetings, social gatherings. It gives them a better perspective of their jobs. It helps them understand the customer better. It helps them to produce more intelligently and effectively.

"Part of the extra time I have recommended should be spent on the



is Domestic Sales Manager of Combustioneer. Thousands of dealers know him as one of the pioneers in the Electric Appliance Industry.

COMBUSTIONEER

AUTOMATIC COAL BURNER FRANCHISE PAYS EXTRA DIVIDENDS

Combustioneer dealers everywhere are proving with trial balances that their franchises pay *double the dividends* of any product they ever sold. Here's why:

1. Combustioneer pinch hits during lean profit months. It helps you keep your good selling men.
2. Exclusive franchises may be arranged.
3. There are no trade-ins to cut your profit.
4. You get national magazine advertising help and factory paid newspaper advertising in

your own town.

5. You get a proved, practical, complete selling program, primed with dealer profits.

Add these facts together and you have some idea of the reason why Combustioneer Automatic Coal Burner Franchise pays extra dividends. But don't be satisfied with less than the complete story of how Combustioneer dominates for dealer profits. Write us today to have a representative call on you. Address, Combustioneer Division of The Steel Products Engineering Company, Springfield, Ohio.



THIS YEAR IT'S

Combustioneer

AUTOMATIC COAL BURNER

FOR HOMES, APARTMENTS AND FACTORIES

Be sure your refrigerator keeps that sales floor complexion.

Porcelain enamel is a mineral substance made glass-hard and fused right onto its supporting metal by 1550° heat.

No other finish could stand such heat, attain such hardness, nor endure so long.

PORCELAIN ENAMEL



PORCELAIN ENAMEL INSTITUTE, INC.
612 North Michigan Avenue
Chicago

Factory Will Control Newspaper Drive on G-E Air Conditioning

BLOOMFIELD, N. J.—A factory-controlled newspaper campaign will be launched this year by General Electric Co.'s air-conditioning department in addition to the company's cooperative newspaper advertising, according to an announcement by J. J. Donovan, manager of the division, at the G-E dealer-distributor convention in the Grand Central Palace, New York City, recently.

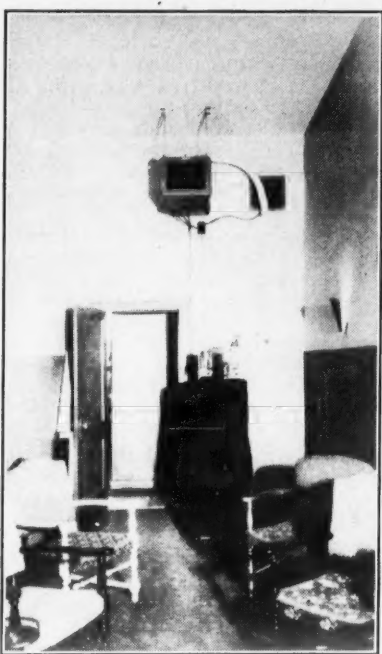
This is the first time in the five-year history of the department that a factory-controlled campaign has been attempted.

The campaign will break during the next week in 30 newspapers located in 16 cities, while the cooperative drive will be carried on simultaneously in cities all over the country. Increase of G-E's air-conditioning advertising budget by about 60% this year has added to the scope of the two promotion ventures.

About 14 national and trade publications will be used to stress the themes of comfort, economy, and health features of G-E air-conditioning equipment. Special attention will be devoted to the recently introduced low-priced oil-fired winter air-conditioning unit which General Electric Co. placed on the market for the first time this year.

Maxon, Inc., is the agency handling the new advertising campaign.

Smallest Theater



The world's smallest air-conditioned movie theater, used by Miami Photo Supply Co., Miami, to demonstrate home movies, was equipped with a ceiling conditioner and a 1-hp. York Freon-12 machine by Alexander Orr, Inc., York Miami distributor.

Importance of Air Conditioning in Color, Offset and Rotogravure Printing Outlined by Chicago Executive

CHICAGO—Air conditioning is bound to play an increasingly larger part in the operations of the printing industry, in the opinion of A. F. Cox, superintendent of maintenance for the Manz Corp., printing establishment here.

"The industry generally is realizing that in some printing operations, air conditioning is absolutely essential to successful work," Mr. Cox declared. Many rotogravure plants, he said, have been forced to suspend operations during hot weather, or in periods when excessive humidity prevailed outside.

"The carbon tissue paper used in the first step of the etching process is exceedingly sensitive to heat and moisture changes," he explained. "Under such changes, the gelatine coating will swell and buckle or crack, then chip or slither from its backing."

"With air conditioning to provide constant weather conditions, this trouble can be prevented. Many Chicago printers have already discovered this fact, and have increased their

profits by installing air-conditioning equipment."

Another printing process in which constant temperatures and controlled humidity are highly important, according to Mr. Cox, is offset work.

"In offset work, weather changes affect the zinc plates, the rubber rollers, and the paper. Unless these factors are constant in size and other physical characteristics, time is lost and material wasted."

Stating that in color work, inability to control these essential factors leads to added difficulties and waste, Mr. Cox said:

"In color work (except where multi-color presses are used) the paper is run through the press for each color separately. Between colors it lies on the floor, a day at a time, where room temperatures and hu-

midity affect its size.

"Fractional changes in the dimensions of the paper, due to changes in moisture content, make it difficult to register the colors correctly. This means loss of time and wasted stock."

While multi-colored presses do away with this difficulty, they are expensive and all printers can not afford to own them, Mr. Cox said. Such printers are forced to refuse business when they know that the weather may prevent them from handling it successfully and at a profit.

"There are other arguments in favor of air conditioning in printing plants," he added. "We have found that composition rollers for inking the forms last longer under properly controlled humidity conditions. A lack of humidity causes static in the press room and additional expense is incurred for slip sheeting certain types of work."

"By humidifying the air, this static can be reduced approximately 75%. Leather belting or tapes, canvasses, and other accessories made of fabric, enjoy a longer life through humidification."

— AIR CONDITIONING SURVEYS —

Syracuse Lighting Co., Syracuse, N. Y.

Industrial Applications

Name	Installation	Hp.
Prior to 1935		
Coughlin Bros. Co., Candy Mfg.		19
During 1935		
Grand Union Co., Food Warehouse	Seibel-Frick	21
Onondaga Pottery Co., Lithograph Dept.	Carrier	152.5
During 1936		
Cortland Baking Co.	Carrier	12
Marsellus Casket Co.	Carrier	18

Offices

Name	Installation	Hp.
Prior to 1935		
The Syracuse Lighting Co., Utility	Buffalo Blower	31.75
During 1935		
Onondaga Pottery Co., Private Office	Westinghouse	1
Onondaga Pottery Co., Private Office	Westinghouse	1
The Syracuse Lighting Co., Private Office	Westinghouse	1
The Syracuse Lighting Co., Private Office	Westinghouse	1
During 1936		
Syracuse Glass Co., Office	General Electric	2
McMillan Book Co., Private Office		1.33

Residences

Name	Installation	Hp.
During 1936		
Irving Belth		1.75

Restaurants & Bars

Name	Installation	Hp.
During 1935		
Schrafft's Restaurant	General Electric	60
During 1936		
Hotel Syracuse		
Coffee Shop	Carrier	33
Cocktail Room	Carrier	15.5
Dining Room	York	40
Onondaga Hotel, Cocktail Room	Airtemp	22
Downyflake Restaurant	York	5.50
Mirbach's Restaurant	Carrier	8.50
Childs' Restaurant	York	22

Stores, Clothing & Dept.

Name	Installation	Hp.
Prior to 1935		
Jay Cobbs, Women's Apparel	Carrier	13
Flah's Women's Apparel	Frigidaire	10
During 1935		
Lincoln Stores, Dept. Stores	Carrier	24
Jay Cobbs, Women's Apparel	Carrier	44
Addis Co., Women's Apparel	Carrier	65.25
During 1936		
Flah's, Women's Apparel	Frigidaire	22
Helmer's, Women's Apparel	Carrier	9
Wells & Coverly, Men's Store	Carrier	24
Thom McAn Shoe Co.	York	13
Rainbow Hosiery	Carrier	3.75

Stores, Grocery

Name	Installation	Hp.
Prior to 1935		
Great Atlantic & Pacific Tea Co.	York	30

Stores, Jewelry

Name	Installation	Hp.
During 1935		
Alans, Jewelry Store	Frigidaire	3.25
During 1936		
Rudolphs, Jewelry Store	Carrier	3.75
Henry's, Jewelry Store	Carrier	6.50

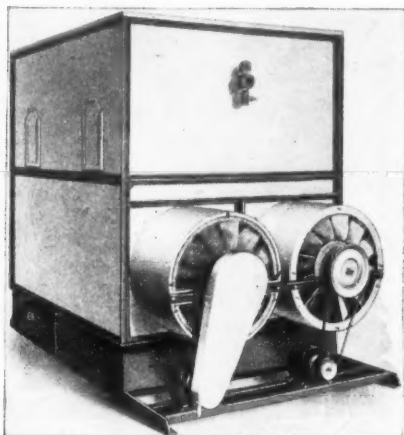
Studios, Broadcasting

Name	Installation	Hp.
Prior to 1935		
WSYR Radio Station	General Electric	3.25

Theaters

Name	Installation	Hp.
Prior to 1935		
Loew's Theater	York	439
Keith's Theater	Sturtevant	245
Paramount Theater	Brunswick-Kroeschell	131
During 1935		
Palace Theater		10

BINKS TOWERS SAVE MONEY!



Indoor Forced Draft Type

FORTIFY yourself on the water consumption & disposal problem which is becoming more difficult. In many sections, MAINS (both supply & disposal) are becoming inadequate as industries demands for water increase.

Use BINKS TOWERS! They give constant recirculation and cut water bills as much as 80%.

Write for Bulletin 70 Today!

BINKS MANUFACTURING Co.
3114-40 Carroll Ave., Chicago.

16 Installations in Chicago in December

CHICAGO—Sixteen installations of air-conditioning equipment were made in this city during December, according to estimates compiled by Commonwealth Edison Co. Equipment installed during the month totaled 1,044 tons of refrigeration, and represented a connected load of 1,205 hp.

Jobs installed during December ranged in size from 250 tons, in the S. S. Kresge Co. building at 6300 S. Halsted, to a residence and two shoe stores requiring 3-ton systems.

Stores and theaters led business classifications with five installations each. Theater systems included one, for 150 tons, in the Stratford, at 701 W. 63rd; another, for 120 tons, in the West Englewood, at 1619 W.

63rd; and a third, for 80 tons, in the Cosmo, at 7922 W. Halsted.

In addition to the Kresge installation, other store jobs completed during the month included two 3-ton systems in French, Shriner & Urner shoe stores; a 40-ton system in Finchley's Store, 19 E. Jackson; and a 10-ton system in Neisner's 5-and-10, 3124 W. 63rd.

The residential installation was made in the home of Ernest Toy, 10146 S. Wood. The Terrace Casino in the Morrison hotel installed a 40-ton system, and the Museum of Science and Industry, on E. 57th, a system of 150 tons capacity. Another large installation was made in the clubrooms of the Chicago Bar Association, 29 S. LaSalle.

Name and Address	Class of Business	Tons	Hp.
Museum of Science & Indus., 1801 E. 57th St.	Civic Building	150	160
Chicago Bar Association, 29 S. LaSalle	Club	50	65
Arvey Corp. (Additional), 3462 N. Kimball	Indus. Miscellaneous	50	59½
Pritzker & Pritzker, 134 N. LaSalle	General Office	20	26
Ernest Toy, 10146 S. Wood	Residence	3	3½
French, Shriner & Urner, 230 N. Michigan	Restaurant	40	44½
Finchley's Store, 19-23 E. Jackson	Store, Clothing	40	40
French, Shriner & Urner, 106 S. Michigan	Store, Shoe	3	3¼
Neisner 5 & 10 (Additional), 3124 W. 63rd St.	Store, Shoe	3	3¼
S. S. Kresge Co., 6300 S. Halsted	Store, Miscellaneous	10	10
Cosmo Theater, 7922 S. Halsted	Store, Miscellaneous	250	320
Frolic Theater, 947 E. 55th St.	Theater	80	80
Hamilton Bros., 2138-60 E. 71st St.	Theater	60	60
Stratford, 701 W. 63rd St.	Theater	60	60
West Englewood, 1619 W. 63rd St.	Theater	150	150
		120	120
Total for December, 1936		1,044	1,205

the SAFE CONNECTION

FOR EVERY AIR CONDITIONING AND REFRIGERATION USE

• It can't leak . . . it can't break . . . it's stronger than the pipe itself. It's proof against vibration, strain and pressure. Arco Copper-to-Copper—non-porous, corrosion-resisting, and smooth inside, with Full Flow Fittings, to cut down friction loss. Get the story of Wrought Copper-to-Copper—standardize on Arco for equipment or replacement. Great variety of fittings available in sizes from ¼" to 4". Write for details to

ARCO PIPE AND FITTINGS DIVISION
AMERICAN RADIATOR COMPANY
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
40 West 40th Street, New York, N. Y.

ARCO
Full Flow WROUGHT
COPPER FITTINGS & PIPE



Meltzer Motor to Distribute Delco-Frigidaire in Miami

MIAMI, Fla.—Meltzer Motor Co., 230 N. E. 14th St., has been appointed distributor of Delco-Frigidaire automatic heating and air-conditioning products in this city.

P. B. Beemsterboer, air-conditioning engineer, and J. D. Rodeheaver, construction engineer, are associated with the company.

Air Conditioning Buyer Uses Unit at Home & in Office

RICHMOND, Ind.—A user of air conditioning who "takes his weather with him as he goes," has been discovered by H. R. Marlatt, head of Electric Service, Inc., Delco-Frigidaire dealer here.

One of Mr. Marlatt's recent sales

was a portable air conditioner for a bedroom in a residence. The buyer was so pleased with the results that he now takes the unit from him to his office on working days, sets it up there, and then at the end of the day takes it home and reinstalls it in his bedroom.

McNeilly to Direct Heating Sales of Warren Norge Co.

NEW YORK CITY—Appointment of A. D. McNeilly to head the new heating division of the Warren Norge Co., Inc., distributor of Norge products here, has been announced by C. B. Warren, president.

Mr. McNeilly was with the American Radiator Co. in its New York and Chicago branches for several years. He was also formerly connected with the Iron Fireman and Stoker Co. in Westchester county.

Installation & Operating Costs Reduced By Using Present Ventilation Systems

MILWAUKEE — Installation and operating costs of air-conditioning equipment may often be cut by utilization of existing ventilation facilities, according to the example set by the Boston Store here.

In 1935 store executives began to investigate air-conditioning equipment. It was found that a 1754-ft. artesian well with a minimum capacity of 1500 gal. per minute could be drilled in the store basement. Such a well, calculations revealed, would furnish enough water at 53° F. to cool the basement, first floor, and half of the second floor, without the aid of a vapor compressor.

Contractors' estimates showed that the cost of drilling the well would be more than compensated for in the smaller operating and equipment cost. Consequently it was constructed and equipped with a deep well centrifugal pump powered by a 150-h.p. motor. When store alterations were completed, cold water from this well was piped to the various cooling units under the control of automatic valves.

Several years previous, the store had installed two central fan ventilation systems to serve the basement and first floor. Each of these systems included a 55,000 c.f.m. fan, air washer, and steam heating coils, and each was connected to a system of ducts and grilles.

The first alteration was the installation of a bank of extended surface water cooling coils in each unit. Eight rows of such coils were placed in the washer housing against the eliminator plates. This enabled the store to use the existing drains, for the washers as well as the eliminator plates carry off the entrained moisture removed from the air by the cold coil surfaces. Filters were then placed in each unit to purify both the

outside and recirculated air.

The center of the first floor had been totally neglected in the previous ventilating installation. This section was now conditioned by means of a self-contained air-conditioning unit which was placed on the mezzanine and connected to three lines of ducts placed along the ceiling adjacent the beams. This unit has an air capacity of 15,000 c.f.m.

The duct system was then redesigned. All of the large square ventilating grilles were replaced by long narrow directional flow grilles. Even when the outside air has been cold enough to supply, naturally, enough chilled air to do the cooling, and no cold water has been used, this redesigned distribution system has operated very satisfactorily.

Early last spring the Boston Store completed remodeling the front portion of the second floor in a "Fashion Colony." Provisions were made for adequate concealing of ducts and

equipment. One central system for this area was impossible because of the inability to conceal large ducts emanating from one point. Consequently this area was cooled and heated with five self-contained units suspended from the ceiling.

They were provided with fresh air connections and each was connected to a series of sheet metal ducts. Each unit constitutes a natural zone and is separately controlled, both for heating and cooling. The controls automatically change the settings of the thermostats to correspond with the outside temperature.

Last summer, during the most torrid of the heat waves, the interior temperature of the Boston Store was kept at 74° F. while outside temperatures rose above the 100° mark. This provision for comfortable shopping did much to eliminate the usual summer sag in business volume.

The entire investment, according to store officials, was considerably less than any of the ordinary installations previously planned. A careful review of the store's account showed that operating costs of this equipment last summer ran about one-fifth of what was expected.

- AIR CONDITIONING SURVEYS -

Springfield, Mass., Installations

Banks

Name and City	Installation	Hp.
During 1936		
Springfield Five Cents Savings Bank, Main St.	Westinghouse	17

Industrial Applications

During 1936		
Westinghouse Elec. & Mfg. Co., East Springfield	Westinghouse	40

Miscellaneous

During 1935		
United Electric Lgt. Co., Printing Dept.	General Electric	9
During 1936		
Hampden Grinding Co., Fisk Ave.	Carrier	23

Offices

During 1935		
Consolidated Eng., Inc.	Carrier	20
Fiberloid Corp., Indian Orchard	Carrier	21
Strathmore Paper Co., West Springfield	General Electric	1.50
Bldg. of Electrical Progress	Carrier	40
Federal Land Bank	Carrier	125
Springfield Shopping News	Frigidaire	1.50
During 1936		
Electric Device, Hampden St.	Westinghouse	1
Mass. Mutual Ins. Co., State St.	General Electric	7.50
Swett Bros., Dwight St.	Frigidaire	1
Fiberloid Corp., Worcester St., I. O.	Westinghouse	7.50
Hadley Furniture Co., Main St.	Frigidaire	.50

Residences

Prior to 1935		
Dwight Ellis Home, Long Hill St.	York	5
During 1935		
A Hastings, Longmeadow	Carrier	1.50
During 1936		
John Holmes, Sumner Ave.	General Electric	1
Ralph Ellis, Mulberry St.	General Electric	1
A Arnheim	Frigidaire	2.50

Restaurants, Cocktails Rooms, and Dining Rooms

Prior to 1935		
Embassy Room—Hotel Kimball, Chestnut St.	York	15
Main Dining Room—Highland Hotel, Hillman St.	York	7.50
Hotel Worthy (cocktail room), Worthington St.	Carrier	2
During 1935		
Hofbrauhaus, West Springfield	Carrier	20
Franklin Cafeteria	Carrier	9
X Lunch	Carrier	3
During 1936		
Highland Hotel, Hillman St.	Frigidaire	7.50
Lorraine Spaghetti Shop, Cor. Main and Lyman St.	York	6.50
Jackson's Restaurant, Main St.	Carrier	9
Windsor Court Cafe, State St.	York	16.50
Wayside Inn (Cocktail bar), Riverdale St.	General Electric	10

Stores

Prior to 1935		
Tom McAn Shoe Store, Main St.	York	5
Jensen's Candy Store, Bridge St.	Carrier	20
During 1935		
Jane Alden Shop (Candy)	Niagara Blower	9.50
Beverly Shop (Dress)	Carrier	2
During 1936		
National Pants Store, Main St.	Frigidaire	1
Grayson Shoppe, Main St.	Carrier	4.50
Foerster's (Fur Store), Bridge St.	General Electric	2
Liggett's Drug Store, Main St.	Westinghouse	17

Hotels

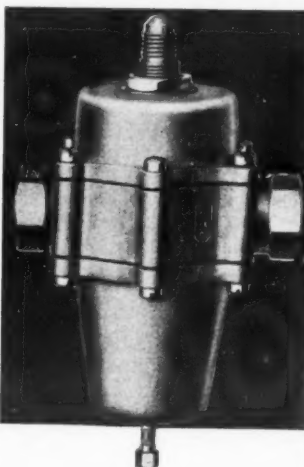
During 1935		
Hotel Worthy	Carrier	20

Theaters

Prior to 1935		
Paramount Theatre, Main St.		235

Undertakers

Prior to 1935		
Dickinson Streeter, State St.	Westinghouse	5
During 1935		
Byron's Funeral Home	Carrier	9



TAG WATER CIRCULATING VALVES For Service Replacement profits

The sound design of the TAG Water Circulating Valve for water cooled compressors shown here is best reflected by its wide acceptance as standard equipment on so many prominent makes of commercial machines. Likewise, its utility as a preferred item for both customer satisfaction and service replacement profits is undisputed.

Due to its positive action the TAG Valve does not waste water but conserves it to actual need.

There are other equally notable TAG Controllers and Test Equipment for Refrigeration Service that you should know about. Send for a copy of the new TAG Catalog No. 1136-25 and ask your jobber about TAG Water Circulating Valves.

C. J. TAGLIABUE MFG. CO.
Park & Nostrand Ave's., Brooklyn, N. Y.

Important To Anyone Interested in AIR CONDITIONING

With the growing interest in air conditioning and with the wider use of compressors for cooling purposes, the demand for satisfactory compressor motors has greatly increased.

Motors to meet this demand are judged largely upon the basis of their efficiency, dependability,

quietness and appearance.

The Wagner line of compressor motors conforms to manufacturers' demands for auxiliary equipment that is ideally suited for driving compressors.

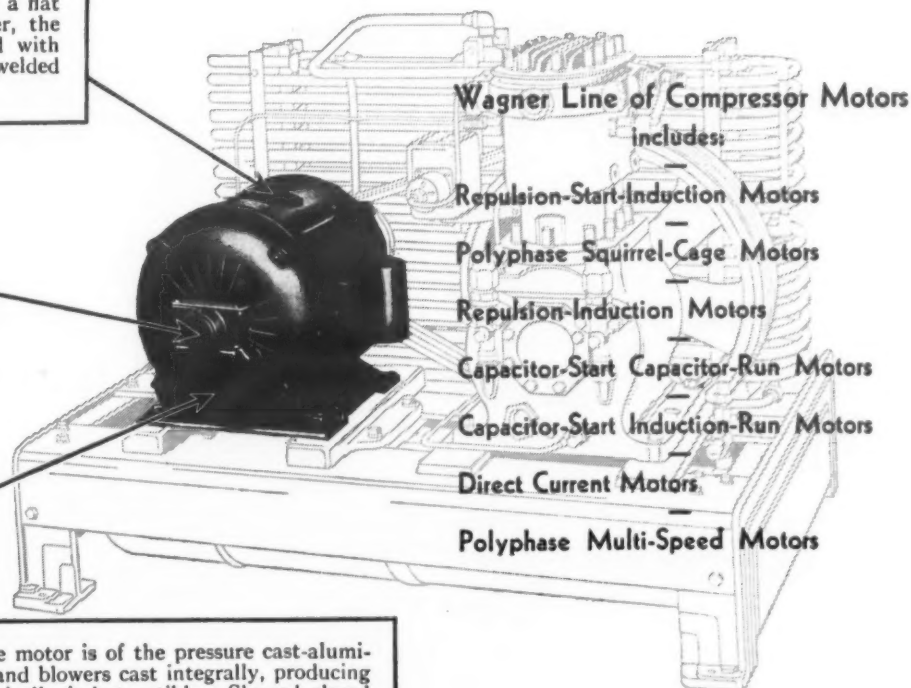
A few of their many features are:

FRAME is all steel — strong, rigid, unbreakable. It is formed from a flat sheet, rolled to form a cylinder, the two ends welded together, and with feet of structural steel securely welded in place.

STEEL-BACKED BABBITT-LINED BEARINGS are accurately machined to secure bearing clearances small enough to avoid any possibility of excessive play and at the same time large enough to provide a liberal oil film between shaft and bearing.

ENDPLATE is cast from gray iron, amply strong and rigid to enable it to stand up even under exceptionally severe conditions.

ROTOR of Wagner squirrel-cage motor is of the pressure cast-aluminum type, with bars, end-rings and blowers cast integrally, producing a one-piece rotor which is practically indestructible. Skewed closed rotor slots minimize magnetic pulsations across the air gap and produce uniform starting torque at different positions of the rotor.



Wagner builds a complete line of motors especially designed for compressors. They are available in any standard horsepower, speed and voltage rating; in many mechanical variations, such as,

resilient-mounting, double-shaft extension, rigid-mounting, etc. Write today for literature on Wagner air-conditioning motors.

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Pedestal & Ceiling Units Added to Mayflower Conditioning Line

DAYTON—Two new styles in room air conditioners have been introduced by Hardy Mfg. Co., Inc., makers of Mayflower air-conditioning and refrigerating equipment. One of the new developments is the pedestal type Mayflower comfort cooler. The other is a ceiling type unit.

The pedestal unit resembles an ash-tray stand and is modernistically designed. It comes in two models, P-12 with a capacity of one ton, and P-24 with a capacity of two tons.

Somewhat similar to a chandelier, the Mayflower ceiling type comfort cooler also is available in either of two sizes, Model S-12, capacity one ton, and Model S-24, capacity two tons.

All connections are run to the top of the units to facilitate installation. Standard equipment on the ceiling

types is a 1/4-hp. vertical ball-bearing motor shipped for 110 volts, 60 cycles, and one phase. Motors of different current specifications are supplied if desired. Units are equipped with one centrifugal type fan, vertically mounted to the motor shaft, the capacities being 1,100 c.f.m. on the S-24, and 750 c.f.m. on the S-12.

The overall height of Model S-24, to the suspension tube, is 19 inches; that of Model S-12 is 15.5 inches. The diameters at the grill are 28 inches on each model. The larger unit has a net weight of 140 pounds, the smaller of 128 pounds.

Hexcel Builds 2 New Models of Heaters and Humidifiers

RACINE, Wis.—The Hexcel Radiator Co. here has added two new models to its line of electric heaters and humidifiers.

Both units are of the portable type, complete with extension cord and wall plug.

Nichrome heating units drawing 11 amperes at 115 volts are used in the heater, which is enclosed within drawn steel housing and mounted on a cast iron base. The entire exterior is done in brown "crackle" except for trimming and grille, which are polished chromium.

The overall dimensions of the heater are 13 1/2 inches high by 7 1/2 inches wide by 6 inches deep.

A heating capacity of 4,265 B.t.u. per hour is claimed. Thus this unit is the approximate equivalent of 18 sq. ft. of direct radiation.

The humidifier is of the motorless type, with all copper body made to resemble a vase, and is rated at 500 watts. An automatic shut-off is provided which cuts off the electric supply in case all of the water is evaporated from the reservoir.

The humidifier is 16 inches high and 11 1/2 inches in diameter, with a storage capacity of 2 1/4 gallons of water. An evaporating capacity of 1 1/2 pints per hour is claimed.

— AIR CONDITIONING ENGINEERING —

Air-Conditioning Fan Must Deliver Air Against High Resistance Pressure And Keep Noise Rating Low

BY F. O. JORDAN

ST. LOUIS—A discussion of fan problems was presented here at the recent annual meeting of the American Society of Heating and Ventilating Engineers by Prof. M. C. Stuart of Lehigh university, and J. B. Lusk of the same institution.

Although the first impression may be to the effect that a discussion of fan problems is not particularly pertinent to the air-conditioning industry on the assumption that all such problems long since have been settled in connection with ventilating work, the truth of the matter is that the design and selection of the fan for air-conditioning work presents a special problem all its own.

This special problem is to select a design which combines very low noise with the ability to deliver air against a fairly high resistance pressure.

The origin of the problem lies in

the fact that many applications of the cooling unit require extreme quietness of operation, yet the resistance to air flow through the unit must of necessity be considerable because the cooling and dehumidifying coil must be of considerable depth in direction of air flow in order for the required latent or dehumidifying work to be accomplished, and because the moisture of condensation which collects upon the coil surface due to air throw through the coil.

Furthermore, the fan must have good pressure characteristics because it is essential that its air delivery be not diminished unduly by the rising resistance to air flow of the air filter as it becomes more laden with the dirt which is removed from the air stream.

The solution of the problem is rendered difficult by the fact that generally the features which result in

good pressure characteristics tend to raise the noise level also.

The purpose of the paper upon "The Special Characteristics of Fans" is to show a basis of comparison which will be of assistance in selecting the type of fan best suited to a given type of service. The method used in achieving the desired result is to reduce to a common denominator the variables which govern fan performance, so that exact comparisons may be made.

"This is done by reducing the characteristics of different types of fans to 'specific' characteristics," Mr. Stuart explained, "in somewhat the same way that the weights of various substances commonly are compared by determining their 'specific weights,' or the ratio of their weights to the weight of the same volume of water.

"Thus: 'The specific diameter, D_s , of any fan operating at a given efficiency is the diameter of a geometrically similar fan which, when running at its corresponding specific speed, N_s , will produce 1,000 c.f.m. at 1 inch head at the same efficiency.

"The specific speed, N_s , of any fan operating at a given efficiency is the speed of a geometrically similar fan of a diameter D_s which will produce 1000 c.f.m. at 1 inch head at the same efficiency.

"The specific tip speed, V_s , of any fan operating at a given efficiency is the tip speed of a geometrically similar fan with diameter D_s and speed N_s at the same efficiency."

In this paper the above specific characteristics were determined for several types of fans (described in Table No. 1), and were plotted against Efficiency-Per Cent in Figs. 1, 2, and 3.

Table No. 2
Fan Type Designations

Type	Description	Source
A	Forward curved blade	Fan Catalog
B	Forward curved blade, double inlet	Fan Catalog
C	Radial blade, double inlet	Fan Catalog
D	Backward curved blade	Fan Catalog
E	Radial blade, narrow	Fan Catalog
F	8 blade airplane propeller fan	Ohio State Engineering Experimental Station, Bulletin No. 77
G	Axial flow fan	A.S.M.E. Transactions, Oct., 1935
H	Slight backward curved blade, narrow	Fan Catalog

A comparison of the above curves is of considerable assistance in selecting the type of fan most suitable for the particular type of service in question.

For example, assume that a fan is to be selected for use in a small residential cooler. Three obvious requirements for such a fan would be high efficiency, small diameter, and low noise level. Since the noise level of a fan is largely dependent upon tip speed, the fan for this service must not operate at a high tip speed.

An examination of the above figures indicates that Fan "H" reaches a good efficiency at moderate speeds, but only at large diameters, so that it is unsuitable for small cooling unit service. However, Fans "A" and "B" show good performance at small diameters and low tip speeds, so that either of these fans seem to be suitable.

Having selected the suitable type of fan, it is of course necessary to select the actual fan and its operating characteristics from the manufacturer's capacity or performance tables or curves.

Fan Performance Curves

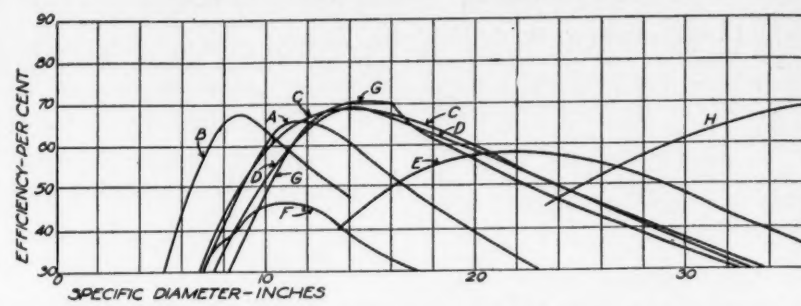


Fig. 1—Specific diameter vs. efficiency for various fan types.

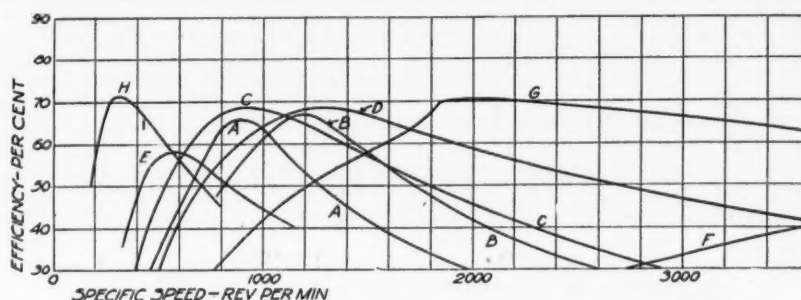


Fig. 2—Specific speed vs. efficiency for fans listed in Table 1.

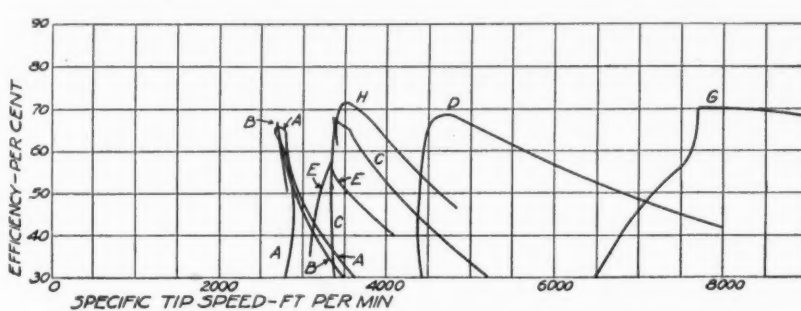


Fig. 3—Specific tip speed vs. efficiency for various fan types.

Carrier Gets \$100,000 Contract To Air Condition Arizona Copper Mine; First Underground Installation Made In U. S.

SUPERIOR, Ariz.—First air-conditioning installation for an underground mine to be made in this country will soon be started in the mine of the Magma Copper Co. here.

This installation will cost in the neighborhood of \$100,000, and the contract has been awarded to the Carrier company of Newark.

The equipment will be installed at the 3,600 foot level. The system is to be used for serving that level, and the 3,400 foot level also, and will be arranged for future expansion to the 4,000 ft. level when required there.

At present, the normal air temperatures at the 3,400 and 3,600 ft. levels range from 95° to 100° F., with relative humidities around 80%. The high moisture content of the air is caused by the large quantities of water always present underground being evaporated by the constantly high prevailing temperatures.

The high temperatures are the result, not of sun-effect as is the case with the usual surface installation, but of the heat which rises from the nether regions of the earth which seem to be not far below. It has been found that these conditions become progressively worse at lower levels.

It is believed here that the high dry bulb temperatures would not in themselves interfere seriously with the work of the miners, were it not for the high humidity. For this reason, the air-conditioning equipment is to be designed and installed especially for maximum humidity reduction, dry bulb temperature reduction being deemed to be of secondary importance.

Since the net result of such performance will be a considerable reduction of effective temperature, there should be a decided improvement with respect to comfort. Furthermore, the general drying out of the working environment which should accompany any considerable reduction in humidity level, should improve working conditions considerably.

In addition to its use in conditioning the worked portions of the mine, the system will be used also for drying out new portions, as such portions must be dried before they can be worked.

The Magma mine now is provided with a forced circulation ventilating system, which circulates surface air throughout the shafts and galleries. While the results obtained from this system are fairly satisfactory at higher levels, the operation at lower levels becomes increasingly difficult and expensive as well as less effective.

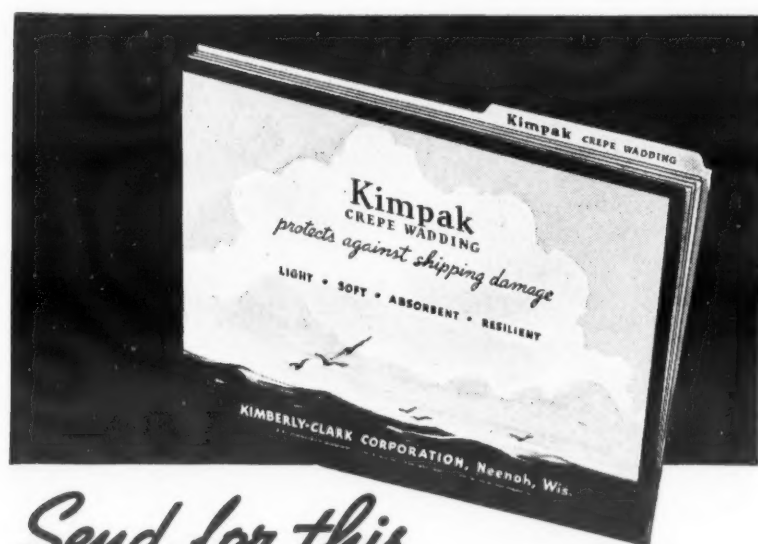
With the new conditioning system, refrigeration will be supplied by four 100-hp. Carrier refrigerating units, and the work of installation is to be carried out by the mining company, as supervised by Carrier.

The management of the Magma Copper Co. expect that production efficiency in the mine will be increased as much as one-third as a result of the new air-conditioning installation when completed, so that the new system soon will pay for itself.

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Safety Devices to Be Used In Attempt to Lower Insurance Rates

SAN FRANCISCO—The cooperation of air-conditioning and refrigerating contractors will be enlisted in a campaign to "make San Francisco safe by 1939," about to be launched here. Sponsors of the campaign hope to offset the city's unfavorable reputation, acquired by numerous apartment house and large building fires, and bring a reduction in insurance rates.

The program includes installation of automatic and manually operated

valves to cut off gas, volatile liquids, and other products utilized for heating, refrigerating, and air-conditioning, to prevent dangers of spread of flames, vapors, and possible explosions. Contractors will be asked to provide these safety measures in new installations, while property owners will be urged to have these features incorporated in existing systems.

Perfex Gives Service Data In New House Organ

MILWAUKEE—Publication of a new house organ, "Perfex Twin Control," has been begun by the Perfex Controls

Co. of this city, makers of automatic controls for refrigeration and air conditioning. W. E. Shultz, advertising manager of the company, is editor.

The first issue of the magazine which appeared recently introduced the Perfex "Twins," "Con" and "Tact," whose activities are carried out as the theme of the publication, which will be issued monthly.

A discussion of the Perfex twin contact switch is found in the first issue, together with a page of cuts representing the complete Perfex line. A column describing the company's fan control appears in the "Service Man's Corner" by the W. R. ("Bud") Miller, head field research engineer.

Strainers & Dehydrators Added to Service Line By Imperial Brass Co.

CHICAGO—Two new sealed strainers and two dehydrators have been added to the line of refrigeration and air-conditioning service equipment produced by Imperial Brass Mfg. Co.

Both strainers are made from 2-inch O. D. copper tube. Model No. 249C is a closely woven asbestos cloth sack and has 17½ square inches of 120 mesh screen. Shell length is 5½ inches with ¼-inch and ¾-inch O. D. SAE and ¾-inch female iron pipe size connections. The asbestos cloth offers additional protection against exceptionally fine particles.

The 248C strainer is built in two sizes: a 2½-inch shell, with 6 square inches of 120 mesh screen; and a 5½-inch shell, with 17½ square inches of screen. Both sizes have the same connection as the No. 249C strainer. This small strainer is designed to remove scale, chips or dirt from the oil.

The brass shell dehydrator has a drier contained in a refill cartridge. This model is built in two shell lengths, 6-inch and 12-inch, with one

cartridge in the smaller size and two in the larger, for ¼-inch, ¾-inch, and 1½-inch O. D. SAE tubing and ¾-inch female iron pipe thread connections.

The shell and flanged end is bolted to allow for quick change. When this end is put on the inlet side, the dirt and scale can be removed when replacement is made. Cartridges are furnished containing activated alumina, calcium chloride, or calcium oxide. The cartridge is made of brass with screen and felt at each end. Added convenience and increased service speed are listed as merits of this dehydrator.

The large steel shell dehydrator is for refrigeration and air-conditioning work. It has a steel shell 4 inches in diameter, and is furnished in 18, 24, and 36-inch lengths. All ends have 1½-inch female iron pipe threads. Screens and steel wool are included.

Five Companies Will Exhibit Automobile Trailers

DETROIT — Five manufacturing companies will display 14 types of automobile trailers at the Detroit and Michigan Exposition, to be held in Convention Hall here April 2 to 11.

COMMERCIAL REFRIGERATION SERVICE

Methods of Correcting & Avoiding Leaks on Flooded Coils

CHAPTER 7—Evaporators & Refrigerant Controls (Cont.)

BY K. M. NEWCUM

Sources of Leaks in Flooded Coils

Another source of serious leaks on flooded coils was the float valve header gasket. These gaskets were composed largely of lead, and the most common cause of float valve gasket failures is traceable to the effect of expansion and contraction resulting from a frosting on cycle and a defrosting off cycle.

The effect on the gasket is as follows: during the "off cycle" frost previously formed melts, and water collects in the space between the float header and evaporator header ring on the underside at the lowest point. During the "on cycle" this small pool of clinging water freezes and the expansion tends to loosen the header bolts very slightly on each cycle, and with continuous frosting and defrosting the expansion is finally sufficient to cause a very slight leak at the bottom-most point of the gasket.

The leaking SO₂ unites with the water to form an acid which in due course of time decomposes a small section of the gasket, allowing harmful amounts of refrigerant to escape in the refrigerator.

A service man should religiously tighten each header bolt every time he has occasion to service a flooded evaporator job, particularly if it is on a defrosting cycle.

Filling the opening with hydrolene or a similar compound completely around the joint between the float valve head and ring will exclude the water and preclude the possibilities of leaks at this point.

Another source of leaks in the earlier systems were cracked or split flare nuts. The earlier flare nuts were machined from stock or extruded brass rod. Due to temperature changes, expansion, and contraction, bar stock flare nuts have been known to split wide open resulting in serious leaks.

Old installations should be carefully

inspected for cracked or split nuts. These old nuts should be replaced with heavy forged brass flare nuts which will successfully withstand these conditions.

Frosting and defrosting or freezing and melting at the suction line connection on the evaporator valve has sometimes resulted in pinched or collapsed tubing between the tube and the tube support on the flare nut. This not only causes a restriction in the suction line, but may pull the flare connection loose, resulting in a leak where either refrigerant is lost or air and moisture is taken into the system, or both.

A collapsed tube is hard to see under the flare nut, but it can be safely said that a very large percentage of suction lines on defrosting coils are collapsed in some degree. A split flare nut and a collapsed tube may be seen in Fig. 128.

Causes of Leaks

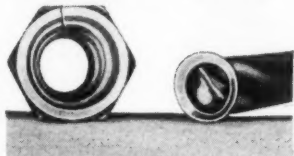


Fig. 128—A split flare nut (left) and collapsed tube (right).

Filling this space between the tube and the nut has been recommended, and many different compounds have been used with a varying degree of success. This method depends largely on the human element in that the installation man may not make a tight seal with the compound, or may forget altogether.

It is highly recommended that a frost-proof flare nut with relief holes in the tube support or a short nut with the tube support reduced to a point where water will not remain at that point be used. A short frost-proof nut is shown in Fig. 129.

Frost-Proof Nut

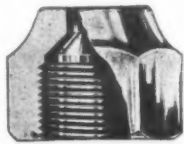


Fig. 129 shows a frost-proof flare nut.

This condition and recommendation applies to any flare joint where frosting and defrosting is liable to take place at any time. The more frequent the defrosting cycle, the more liable is the tube to be collapsed.

Most flooded coils are equipped with one or more screw type strainers. There will most always be a strainer between the evaporator liquid shut-off service valve and the float needle and seat. It will be found that this is a very fine mesh screen. When this screen clogs with dirt, scale, or carbon, it is necessary to evacuate the evaporator and remove the service valve to get to the screen.

This is a rather expensive service job and often a difficult one. Considering that the source of foreign material is usually at the condensing unit, it is considered good practice to remove and do away with this inside screen and install a good filter in the liquid line near the receiver. A filter at this location is more easily changed, cleaned, or serviced, effecting a considerable saving in time, energy, and loss of refrigerant.

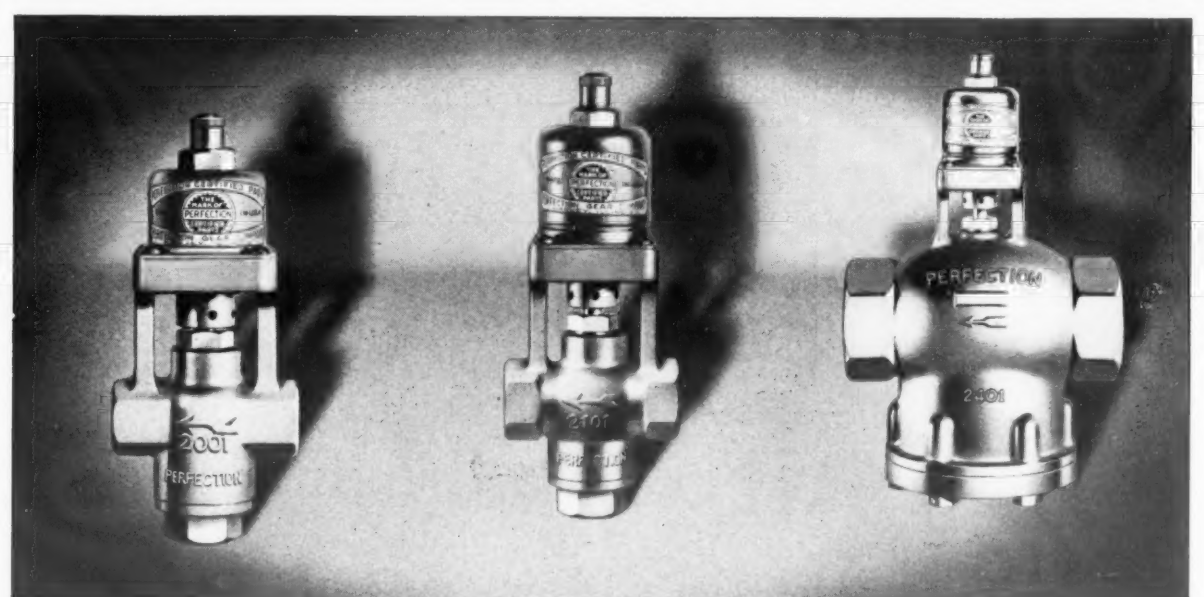
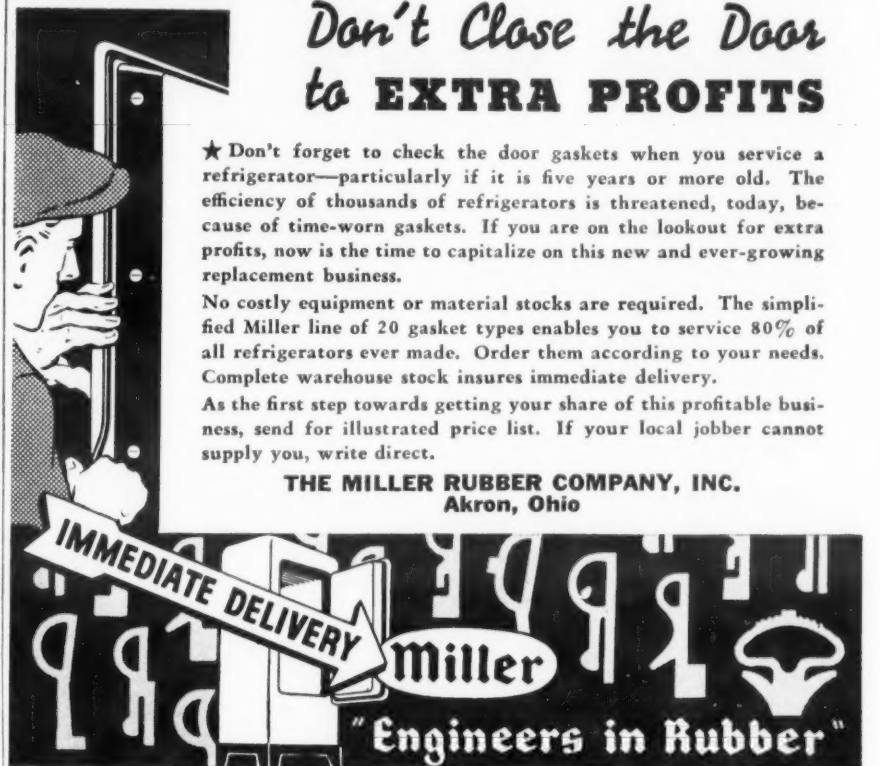
Don't Close the Door to EXTRA PROFITS

★ Don't forget to check the door gaskets when you service a refrigerator—particularly if it is five years or more old. The efficiency of thousands of refrigerators is threatened, today, because of time-worn gaskets. If you are on the lookout for extra profits, now is the time to capitalize on this new and ever-growing replacement business.

No costly equipment or material stocks are required. The simplified Miller line of 20 gasket types enables you to service 80% of all refrigerators ever made. Order them according to your needs. Complete warehouse stock insures immediate delivery.

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Varying water pressure has no effect on these valves because the water inlet is under the seat. Water pressure, plus a small light stainless steel spring, forces the seat disc and piston up, thereby making a perfect seal against the rubber.

Available in a range of sizes from 3/8" to 3" inclusive, all standard pipe sizes—with a range of opening points from 45 lbs. to 175 lbs. gauge.

Regulators have easily removable bolt-on type flange cap.

Self-contained strainer is easily re-

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Quality materials used throughout, guarding against corrosive action and abuse in service.

All these valves can be used on water pressure up to 150 lbs.

Application tested before shipped, a final check to insure certified quality.

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DETROIT

ALD CONTROL VALVES
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Jenkins Establishes Airtemp Dealership in Tulsa

TULSA, Okla.—W. W. Jenkins, oil and realty dealer here for the past 10 years, opened a dealer's office for Airtemp Corp. at 708 South Boston Ave. on Jan. 18.

Five More Chicago Theaters Are Air Conditioned

CHICAGO — Five more Warner Brothers theaters here—the Cosmo, Frolic, Stafford, Hamilton, and West Englewood—have been equipped with air-conditioning systems, reports K. C. Porter of Commonwealth Edison Co.

G-E Reviews Progress Made In Air Conditioning Field

NEW YORK CITY—More than 100 distributors and dealers for General Electric air-conditioning equipment met here during the first three days of last week in a "grand jubilee" celebration of the company's five years in the industry.

Entitled "Profits from the Air," the convention reviewed the progress made by the company in its first half-decade, and projected product, sales, and advertising plans for the year ahead. J. J. Donovan, manager of G-E's air-conditioning department, was in charge.

Headquarters were in the Electrical

Association auditorium of Grand Central Palace, and the annual banquet was held in the Hotel Ambassador. Last day of the meeting was held at the General Electric factory and laboratory at Bloomfield, N. J.

Emerson Uses Three Blades On 1937 Air Conditioners

ST. LOUIS—The 1937 line of Emerson-Electric air conditioners includes 24 and 30-inch two-speed models for alternating current and one-speed models for direct current.

All are equipped with three-blade fans which are claimed to give greater breeze penetration and quieter operation without increase in current used.

nozzle which atomizes the fuel and sprays it into the combustion chamber. Primary air is blown through the tube which usually contains baffles that impart a rotating motion to the air.

Electrical ignition generally is provided with this type of burner, so that the air and oil vapors are ignited as mixed. Oil pressure to the nozzle is supplied by a pump generally of the gear type. Electricity is supplied from a high voltage transformer. The chief difficulty in this type of burner is its inability to operate satisfactorily at low combustion rates.

Chief advantage of this burner is its ability to burn No. 3 or No. 4 oil, whereas other types of burners generally do not operate satisfactorily on oils heavier than No. 1 or No. 2.

At one time most oil burners were of the "conversion" type, intended for converting coal-fired boilers and furnaces into oil-fired installations. However, the complete boiler-burner unit, consisting of a burner installed complete in a boiler designed and built expressly for oil burning service, is rapidly gaining ground.

GAS BURNER APPLICATION

Use of the gas burner also is rapidly becoming more general. The gas burner is made as a conversion burner, or is built into a boiler specially constructed for gas-burner service. This type of boiler is constructed with more narrow gas passages than would be proper for service with soot-forming fuels, for the purpose of increasing the heating surface. The gas burner consists principally of a nozzle arranged so as to obtain the proper mixture of gas and air and discharge the combustible mixture into the combustion chamber.

Automatic Controls & Zoning

Automatic Controls and Zoning: Automatic controls may regulate temperature, humidity, or pressure. Temperature controls are known as "thermostats," humidity controls as "humidistats," and pressure controls as "pressurestats."

TYPES OF THERMOSTATS

Thermostats are of the following types:

1. *Metallic Bar Type:* This thermostat consists of a metallic bar where change in length, due to temperature change, is used to move the control mechanism. This type of thermostat is rarely used, since the movement resulting from temperature change is very slight.

2. *Bi-metallic Strip Type:* This thermostatic element is made of two metallic strips of different coefficients of expansion, so arranged that the unequal expansion or contraction of the strips due to temperature change produces a warping which moves the free end of the element (one end of the element being fixed). This thermostat is commonly used, as the movement per increment of temperature change is relatively large. The bi-metallic element may be straight, curved, or spiral in shape.

3. *Diaphragm Type:* This type consists of two flexible, corrugated, metallic diaphragms soldered together, with a liquid or gas-filled space between. The expansion and contraction of the liquid or gas resulting from temperature changes regulates the spacing between the centers of the diaphragms. This movement is used to actuate the controls.

4. *Liquid-Filled Tube Type:* This consists of a tube or bulb connected by a flexible capillary tube to a small diaphragm, the entire assembly being filled with liquid or gas and the bulb being exposed. The movement of the diaphragm produced by variations in the volume of liquid or gas due to temperature changes at the bulb is used to actuate the control mechanism.

The thermostat generally is used to regulate temperature by controlling the setting of a valve in the steam or hot water supply, by setting a damper in an air supply duct, or by controlling the operation of a motor. However, it is not customary to employ the movement of the thermostat directly in regulating the equipment,

Author



F. O. JORDAN

Author of the "Air Conditioning Made Easy" series, has joined the editorial staff of Air Conditioning and Refrigeration News.

as such movements generally are small and of no great force.

It is therefore customary to utilize the action of the thermostatic element for actuating an electric or a pneumatic switch which in turn sets in motion a solenoid, or a pneumatic or electric motor that operates the valve or damper.

Thermostats are of the following types as to location or usage:

1. Wall or room type, usually with ornamental case for mounting upon a wall in an occupied room. The thermostat must be so located that there is a good circulation around it of air at average room temperature, and so that it cannot be affected by outside temperatures or by the direct action of heating equipment.

2. Duct type for mounting outside a duct with an extended stem containing the thermostatic element, extending into the duct.

3. Self-contained type, consisting of thermostatic element and valve. With this type, the action of the thermostatic element operates the valve directly. This type of control may be used upon individual direct radiators for obtaining room temperature control, or it may be used with the forced circulation heating unit. In the latter case, a long flexible capillary tube should be provided for transmitting the action of the thermostat directly to the valve, so that the sensitive bulb may be placed in the recirculating air intake at the unit where it will be subjected to the average temperature of the air which is being drawn from the room.

HUMIDISTAT & PRESSURESTAT

The *Humidistat* may consist of two thermostats, one being actuated by the dry bulb temperature, and the other being actuated by the wet bulb temperature through the action of a saturated wick, both elements being so interconnected that their resultant action is based upon relative humidity, or the humidistat may consist of wood, hair, fibre, parchment, or other material which responds quickly and consistently to the moisture level of the air so that contraction and expansion with change of humidity produces a motion which may be used to operate an electric or pneumatic control for operating a valve in the steam or water supply line to a humidifier. Humidistats are made in both the wall and the duct type, as described above for "Thermostats."

The *Pressurestat* generally consists of a corrugated flexible metallic diaphragm or bellows, so connected to the piping or equipment (the pressure within which it is to control) that a motion is produced by changes of pressure. This motion may be transmitted directly to a damper or motor, or it may be transmitted through the agency of electricity or compressed air, as described above for the "Thermostat."

- AIR CONDITIONING MADE EASY -

Selection of Fuel Burning Equipment; Use of Automatic Controls in Heating

SECTION NO. 7 (Continued) Heating

BY F. O. JORDAN

Fuel Burning

Regardless of the type of boiler or furnace used, heat must of course be generated by burning some fuel. Those most commonly used are coal or coke, fuel oil, and gas. As stated above, the design of the combustion chamber must be suited to the fuel. Coke and anthracite require large fuel storage capacity with plenty of secondary heating surfaces, while bituminous coals need large combustion chambers with heating surfaces easily accessible for cleaning.

Gas burners require plenty of heating surface intimately exposed to the flame.

The oil burner requires ample combustion space and heating surface, with provision for long flame travel.

In coal burning, the type and area of the grates are very important, and it is essential that ample air be provided for combustion.

This air is divided into two portions, the "primary" air, which enters through the fuel bed, and the "secondary" air, which enters the combustion space above the fuel bed.

With the hand-fired grate, approximately six to eight pounds of coal may be burned per hour per sq. ft. of grate area, while with the stoker in heating service, from 15 to 30 pounds may be burned per hour per sq. ft. of grate. Approximately 15 pounds of air must be provided per pound of coal. The volume of a pound of air at various conditions is given by Table 6, Section 21.

The proportion of air which must be secondary air, increases with the grate area, the rate of combustion, the depth of the fuel bed, and with the

freshness of the coal which has been fired. The proportion of secondary air increases also as the size of the lumps of coal is decreased.

ECONOMY OF STOKER

Generally, considerable fuel economy may be obtained by the use of the stoker, not only because of the greater efficiency of mechanical firing as compared with hand firing, but also because the coal is supplied more uniformly, as required, and distribution over the bed is more even. Stokers are divided into the following classes:

Overfeed Type: In this stoker the coal is fed in an even layer at the front of the grate, and is moved across the grate (which usually is inclined) by the reciprocating or rocking action of the grate bars or links, the clinkers being dumped at the rear. Frequently, a combustion arch is provided over the grate to assist in maintaining the temperature required for combustion. This stoker is suitable for coking fuels of low volatile content.

Chain Grate: In this stoker the coal is fed in an even layer at the front of the grate, which forms an endless belt and moves to the rear, carrying the fuel bed with it and dumping the clinkers at the rear. As with the overfeed type, a combustion arch is often used with the chain grate. This stoker may be used satisfactorily with low grade fuels.

Underfeed Type: With this stoker the coal is forced into one or more "retorts" below the fuel bed by means of a screw or plunger. Since the fuel is fed from beneath the fuel bed, volatiles, as they are distilled off, must pass upward through the burning fuel, so that combustion is satisfactory

without the use of a combustion arch. This type of stoker is suitable for most grades of fuel, generally gives smoke-free operation, and adjusts itself quickly to varying loads.

All stokers are provided with a hopper of sufficient size to hold fuel for several hours operation. Generally, a forced draft fan is provided for supplying air.

USE OF OIL BURNER

With the oil burner, air supply may be by natural draft or by forced draft, or by a combination wherein "primary" air is supplied through the burner by forced draft, and "secondary" air is supplied by natural draft.

The oil burner may be of the automatic type in which combustion ceases upon rising pressures or temperatures, and which is reignited by a gas pilot or by electric ignition when operation is required, or may be of the "high-low" flame type, which burns continuously.

In the case of the latter type, the high combustion rate is above that necessary to carry the load, while the low rate is below that required by the load, so that the burner alternates between high and low flame as necessary to balance the load. In large installations which are under constant supervision, firing may be under manual control.

DOMESTIC OIL BURNERS

Burners for large installations often are of the steam-atomizing type. However, domestic burners may be divided into three general types, as follows:

1. *Pot Type:* The oil is fed into an incandescent pot into which "primary" air is blown.

2. *Pressure Atomizing Type:* Oil is sprayed by forcing it through an atomizing nozzle around which "primary" air is forced.

3. *Rotary Type:* Oil is atomized by being thrown through a spinning cup or disk around which "primary" air is blown.

The early types of burners were generally of the "pot" type, and a number of good burners of this type are on the market at present. Some trouble has been encountered in the past by erosion or oxidation of the pot, by carbon deposits in the pot, due to cracking of the fuel at high temperatures or failure to completely vaporize the fuel and mix it with the air, and by the difficulty of securing proper ignition during intermittent operation, because this type of burner depends upon the heat of the bowl for vaporizing the oil. One advantage of this type of burner is that it may be operated at very low rates of combustion.

The "rotary" type of burner was the next to come into general use. In this burner the oil is fed from a chamber in which the oil level is maintained by a float valve. From the float chamber, the oil is fed into a cup or spinner from the edge of which the oil is thrown by centrifugal force toward a circular refractory enclosure which is concentric with the spinner. Primary air is blown into the combustion chamber from beneath the spinner, so that the oil spray and air are mixed between the spinner and the refractory wall.

The rotary burner is economical to build, simple, obtains high efficiency and operates satisfactorily at very low combustion rates. The chief difficulties which have been encountered are those rising from trouble with the refractory wall, and from the fact that good heat transfer to the boiler or furnace heating surfaces is somewhat retarded by the small area of incandescence.

The pressure atomizing type of burner or the "gun" type, as it is commonly known, is one of the later developments and seems to be gaining in its field.

This burner consists of a blast tube in which is located the atomizing

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The Noise Problem in Air Conditioning

The air-conditioning industry is no exception to the truism that the development of any new thing invariably results in some unexpected by-products. Some of these by-products may come as pleasant surprises, but usually there are others that are "just too bad."

One of the unwelcome features attendant upon the development of air conditioning is that parasitic growth commonly known as "noise consciousness," which has fastened itself upon a considerable number of the users of such equipment.

Generally both manufacturer and dealer-contractor have discovered that it is fully as hopeless a task to reduce noise levels satisfactorily by means of sporadic "by guess and by gosh" methods as it is to change a noise conscious customer's mind, while everyone in air conditioning has longed for

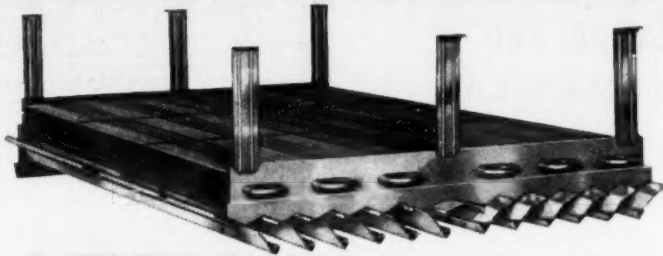
definite, easily applied design factors by means of which acceptable noise characteristics may be designed into an air conditioner or an air-conditioning system.

Just presented at the forty-third annual convention of the American Society of Heating and Ventilating Engineers are two papers reporting the results of research conducted during the past year under the auspices of the Society upon the subjects of noise and its control.

The digest of this important information, being of considerable extent has been divided into two instalments, of which the first, a report of, the paper, "Nature of Noise in Ventilating Systems and Methods for its Elimination" appears in this issue of AIR CONDITIONING AND REFRIGERATION NEWS, while the other instalment will appear next week.

— BUYER'S GUIDE —

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— AIR CONDITIONING ENGINEERING —

Nature of Noise in Ventilating Systems & Ways to Reduce It Described at ASHVE Meeting

BY F. O. JORDAN

ST. LOUIS—The paper "The Nature of Noise in Ventilating Systems and Methods for its Elimination" presented at the recent convention of the American Society of Heating and Ventilating Engineers here by J. S. Parkinson, Johns-Manville engineer, had much information of value to the air-conditioning engineer and contractor because complete correlated design data by means of which the noise characteristics of the air-conditioning unit or system actually may be designed to meet the requirements of the air-conditioning project, although not generally available, is very necessary in order to eliminate the serious trouble and dissatisfaction with many installations due to the noise which results because the noise angle was not properly considered in their design.

It is a well-recognized fact that equipment which may have the most artistic exterior, and that may be a success in accomplishing its prime purpose, which is that of keeping temperature and humidity within the comfort zone, certainly will be thrown out together with its creator if it results in a noise level which gets on the consumer's nerves.

In the case of the air-conditioning system, noise comes from one or more of the following sources:

1. The air-conditioning unit itself (motors, fans, compressors, refrigerant gas flow, etc.)
2. The air distribution system of ducts.
3. The discharge grilles.

Noise generally results from poor design of air passages, or from false efforts to cheapen the installation by the use of high fan tip speeds and outlet velocities, high duct air velocities, omission of stiffening of large sheet metal surfaces, omission of sound insulation, use of poor workmanship, etc.

In the case of the ductwork high air velocities allow the use of smaller and cheaper ducts, but tend to result in higher resistances to air flow, and in higher noise levels. For good design, the air velocity should be as high as is consistent with acceptable air pressure loss, and noise.

In the case of the cooled-air system, the size of the outlet grilles is

determined by the required distance of air throw, by the vertical distance through which the air may be allowed to fall without striking the occupants, by the temperature differential between the air in the room and the air as it enters the room, and by the allowable noise level. The first three factors must be considered in order to obtain good and temperature distribution.

The longer distance of air throw, the lesser allowable distances of vertical fall, and the greater temperature differentials all tend to require higher air velocities through the grilles, which obviously will result in higher noise levels.

Approved procedure in selecting the grille and the air velocity through the grille is first to make proper allowance of the three factors which govern distribution, and then to check from the angle of allowable noise level. If it appears that noise level will be too high, it will be highly advisable to employ a greater number or air-supply openings located closer together and/or to make use of larger air quantities at lower temperature differentials, so that air-supply velocities may be reduced.

Obviously, the necessity of making such a number of fine distinctions demands simple and accurate design data, not only regarding air distribution characteristics, but regarding noise control. In the interests of simplicity, we have omitted certain material which although important, is of interest only to the scientist, in favor of those portions containing data and explanations which apply directly to the problems of the air-conditioning engineer.

Particular points of interest in these papers are:

At a given loudness level, annoyance increases with frequency. However, the frequency range between 128 and 512 cycles usually requires most attention because loudness level generally is much higher within this range.

Insulate fans and motors from ducts and building construction—keep fan speeds low—avoid air turbulence—stiffen large surfaces to avoid resonance.

In cases where sound-absorbing materials are used in connection with ducts, place such materials at the discharge end of the air passage rather than at the fan end so that noises which originate in the duct will be eliminated along with fan noises.

Loudness level at a given point of a given type (not size) of grille is dependent not only upon air velocity, but upon air quantity as well. That is, loudness level increases with size of grille, even with air at the same velocity.

In the case of medium or large highly absorbent rooms with grilles spaced some distance apart, grille noise may be estimated upon the basis of the largest grille only.

Some necessary definitions are:
The intensity of a noise is the measure of the energy of its pulsations.

The loudness level of a noise is the sensation of pressure pulsations of noise as registered by the human ear. The unit of measure of the loudness level is called the decibel (db), which equals 10 times the log₁₀ of the intensity. Thus the formula for relating loudness and intensity becomes

$$IL = 10 \log_{10} R$$

where

$$IL = \text{Loudness increase in DB}$$

$$R = \text{Ratio of intensities.}$$

Therefore, if the intensity is doubled, the loudness level is raised by 3 db; if intensity is multiplied by 10, the loudness level is raised by 10 db; if intensity is multiplied by 100, the loudness level is raised by 20 db.

The sabine is the unit of sound absorption. One square foot of totally absorptive surface is equal to one sabine.

NOISE IN THE DUCT SYSTEM

In cooperation with the A.S.H.V.E. Technical Advisory Committee on Sound in Relation to Heating and Ventilation, a table was prepared of typical noise levels as they are encountered in various room locations. These values are presented in Table 1.

It has been suggested that as a

(Continued on Page 24, Column 3)

Table 1—Typical Noise Levels in Various Locations

	Loudness Level in Decibels to be Anticipated*				Loudness Level in Decibels to be Anticipated*		
	Min.	Repr.	Max.		Min.	Repr.	Max.
Sound Film Studios	10	14	20	Stores—General—Including Main Floor	50	60	70
Radio Broadcasting Studios	10	14	20	Department Stores	40	50	60
Planetarium	15	20	25	Hotel Dining Rooms	40	50	60
Residence Apartments, etc.	25	35	40	Restaurants and Cafeterias	50	60	70
Theaters—Legitimate	25	30	35	Banking Rooms	50	55	60
Theaters—Motion Picture	30	35	40	Factories	60	70	80
Auditoriums, Concert Halls, etc.	25	30	40	Office Machine Rooms	60	70	80
Churches	25	30	35				
Executive Offices—Treated Private	25	33	40	Vehicular Noise			
Offices	35	45	50	Railroad Coach	60†	70	80
Private Offices—Untreated	35	45	50	Pullman Car	55†	65	75
General Offices	45	55	60	Automobile	50	60	70
Hospitals	25	40	55	Vehicular Tunnel	75	85	95
Class Rooms	30	35	45	Airplane	80	85	100
Libraries, Museums, Art Galleries	30	40	45				
Public Building—Court Houses, Post Offices, etc.	45	55	60				
Small Stores	40	50	60				
Upper Floors Department Stores	40	50	55				

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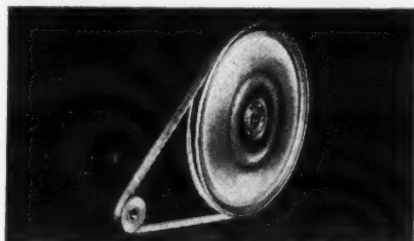
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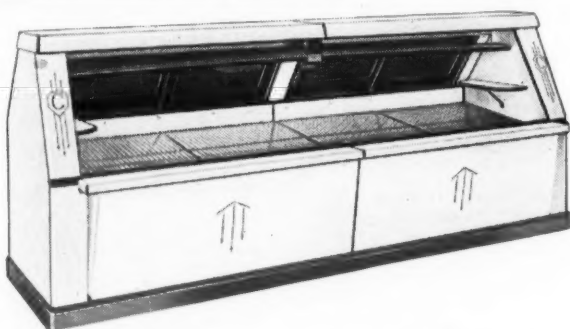
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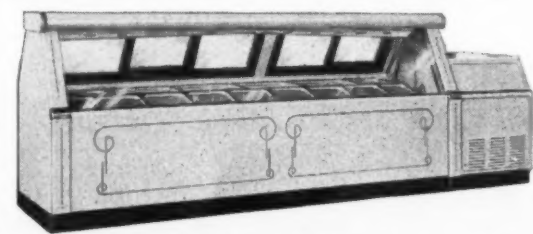
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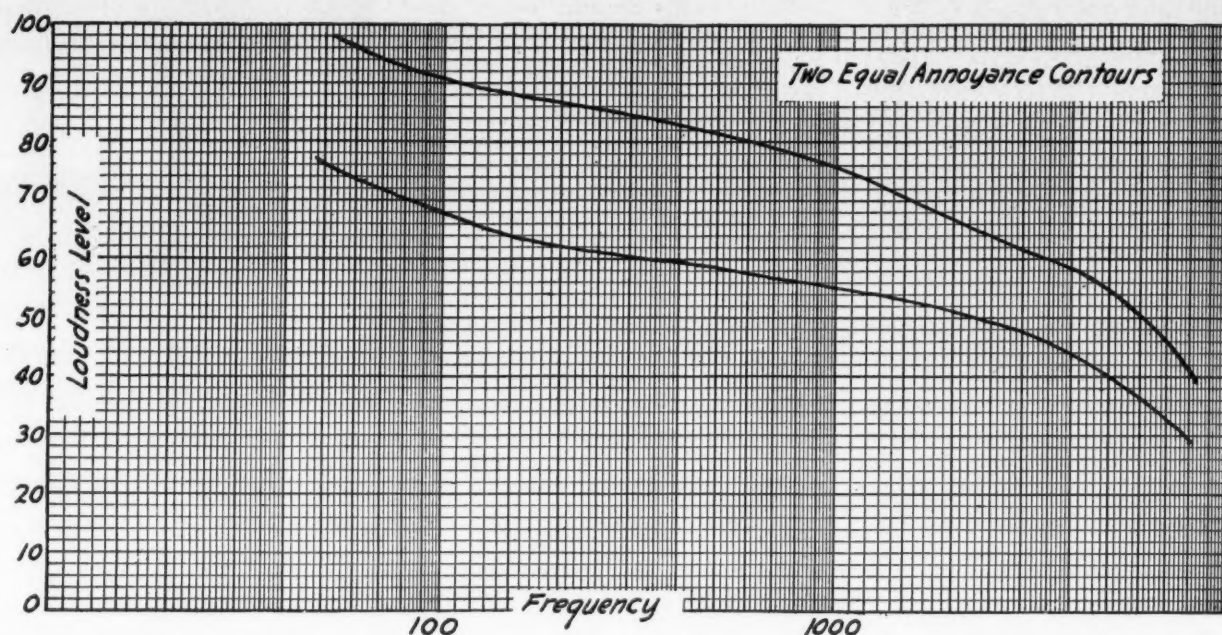
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Fig. 1.—Curve of Disturbing Effect of Various Frequencies



Three Main Sources of Noise in Blower Systems Need Various Kinds of Treatment

(Continued from Page 23, Column 3)

temporary procedure the equipment noise level should not be greater than the background noise level already existing in the space. This means that when the equipment noise is present the total noise will be increased 3 db (decibels). In cases where the equipment noise must be practically eliminated, it will be necessary to reduce such noise to a point about 10 db below the background level.

Such a procedure disregards the effect of frequency variations, but since the problem of annoyance versus frequency distribution is so complex, no simple specifications can be set up to cover this point. In general, though, it may be said that the loudness level at any frequency should not be greater than the background noise, and at the high frequencies the loudness of the equipment noise should if possible be materially lower.

Two curves (plotted by Hale Sabine) are shown in Fig. 1, which may be called equal annoyance contours. The curves are drawn so as to pass through a loudness level for each frequency which is equally as annoying as any other point on the curve.

Thus it may be estimated that a loudness level of 40 db at 5,000 cycles is just as annoying as one of 55 db at 1,000 cycles, and that at 100 cycles it requires a loudness level of 68 db to be as annoying. The important fact to observe is that annoyance increases with frequency, and levels which are not disturbing at low frequencies may in consequence become troublesome at high frequencies.

CHARACTERISTICS OF NOISE IN VENTILATING SYSTEMS

In order to meet these requirements it is necessary to know the nature and source of the noise caused by ventilating systems. It must be determined where these sounds originate, how they are transmitted, and what measures can be taken to eliminate them.

The noise encountered in ventilating systems has three general sources, the motor, the fan, and the air itself. The motor generates frequencies which are related to the rotational speed and the electrical frequency.

The fan may generate sounds which are a function of its rotation frequency, and will also generate frequencies which are multiples of the blade frequency.

The air moving past roughnesses or obstructions in the duct is set into vortices which give off high frequency sound.

There may also be noise generated at the outlet resulting from the abrupt change in dimensions or from faulty grille design.

Usually of particular interest is the noise at a point a few feet from the outlet of the duct where it enters the room.

Two ventilating systems were investigated under actual conditions of use. System "A" was an exhaust system connected to the blower through about 30 ft. of 6-inch x 20-inch duct, opening into a small office through an opening in the side. The motor in this system was definitely noisy. System "B" was a pressure system opening into a small office through about 30 ft. of 10-inch diameter round duct with a right angle bend at the opening and three more such bends between the opening and the fan. These systems were both sufficiently noisy to cause complaints. Air speeds were in the normal range for such installations. The frequency distributions were as follows, expressed in terms of loudness level:

	0-64	64-128	128-256	256-512	512-1024	1024-2048	2048-4096	Total
System A	51	55	72	65	63	55	51	73
System B	62	57	69	66	55	43	36	71

In four systems out of these six the frequency band from 128 to 256 cycles contained the highest amount of energy. In the remaining cases the next highest frequency band—from 256 to 512 cycles—became more prominent as the air speed was increased. In every system measured during the course of these experiments the major part of the energy lay in this range.

Therefore, if a reduction in the total loudness level is desired, a reduction in this range of frequencies is the first essential. Since decibel levels must be added logarithmically to arrive at a total, even a large decibel reduction in a high frequency band will make only a small fraction of a decibel change in the total loudness level. On the other hand, a reduction in one of the higher bands may make a very appreciable difference in the annoyance factor.

METHOD OF ELIMINATING NOISE

There are a number of methods of preventing noise in ventilating systems. Vibrations can be prevented from telephoning through the walls of a duct by using suitable flexible connections between the fan and the duct. The fan and motor should be separated from the building structure by the vibration insulating mounting.

Table 2
Loudness Level in Decibels at Various Speed Ranges

Frequency	Various Speed Ranges			
	700 to 780 f.p.m.	1234 to 1570 f.p.m.	1760 to 2085 f.p.m.	2580 to 3440 f.p.m.
Total	59	77	59	74
0-64	5	20	14	35
64-128	19	41	24	45
128-256	58	72	58	69
256-512	53	75	53	73
512-1024	47	66	45	61
1024-2048	45	65	43	58
2048-4096	42	63	42	58

Table 3
Increase in Intensity Level at Various Frequency Bands
Expressed in Decibels Per Velocity Increase of 100 f.p.m.

	With Construction On Intake (in db.)	Without Construction On Intake (in db.)
Total	2.0	0.92
0-64	1.15	0.84
64-128	1.85	0.95
128-256	1.85	0.78
256-512	2.64	1.31
512-1024	2.75	1.37
1024-2048	2.94	1.31
2048-4096	3.13	1.38

Fan speeds should be kept as low as possible, and equipment should be well balanced and free from excessive vibration.

Large duct sections should be braced to avoid resonance and diaphragmatic response. Construction should be such as to avoid unnecessary air turbulence. All these are precautions which any competent engineer will observe.

But there are many cases where even with all precautions the system is still unsatisfactory. In such cases sound absorbent lining placed inside the duct can be used with good effect. In choosing such a lining, a number of factors must be considered. The most obvious is sound absorbing efficiency, especially in the range below 500 cycles.

Nearly all acoustical materials display high efficiency at the upper frequencies, but special design is necessary to obtain efficiency in the low frequency range. If a porous material is used, it must possess a fairly high flow resistance.

In addition to a good absorption-frequency characteristic, the material must be resistant to moisture and vermin, non-combustible, and must offer little frictional resistance to the passage of air across its surface.

The formula for computing energy reduction in db has been worked out to be:

$$R = -2.84 l \left(\frac{p}{a} \right)^{\frac{1}{2}} \log (1-c)$$

(introducing the length factor 1)

Where

R = Energy reduction in db

l = Length in ft.

p = Perimeter of duct in ft.

a = Cross sectional area of duct in ft., and

c = absorption coefficient of reflecting surface.

The data in column 4 of Table 4 are calculated from this formula and the absorption coefficients of the materials as published.

The formula in its present form indicates several facts of fundamental importance. As long as the shape factor is constant, the larger the duct, the smaller will be the attenuation.

Attenuation increases more and more rapidly with increasing values of a. It is therefore desirable to use absorbing materials having as high a coefficient as possible.

For example, in any given duct a material having 75% absorption will produce three times as much attenuation per lineal foot as one having a coefficient of 37½%.

FAN AND BLOWER NOISE

The final step in these experiments was to apply the conclusions obtained (Concluded on Page 25, Column 1)

Tests on Treatment Of Blower Noise Is Described by ASHVE

(Concluded from Page 24, Column 5) above to actual ventilating system noise.

For this purpose a new test setup was constructed with a large blower (63 forward curved blades, capable of delivering 6,000 c.f.m. at 200 r.p.m.) in one room, a length of test duct leading through a carefully sound-insulated wall into another room, and microphone at the outlet of the duct in the receiving room.

The fan was of the multi-blade type, driven by 5-hp. electric motor. Both fan and motor were mounted on a vibration insulating platform to prevent direct communication through the floor.

The fan was connected via a 39-inch adapter to the test duct, which was 18 inches by 18 inches and 14 ft. long. The air was taken in and exhausted through large doors 3 ft. 6 inches x 7 ft.

The duct itself was wrapped with 2 inches of rock wool blanket to avoid transmission through the walls into the receiving room. The microphone was placed in the test room. The duct was sealed off at a point before it entered the test room with an air-tight seal.

REDUCED NOISE

This procedure reduced the noise at all frequency bands to a point well below the levels measured during test. It appears safe to assume, therefore, that whatever sound reached the test room came through the duct.

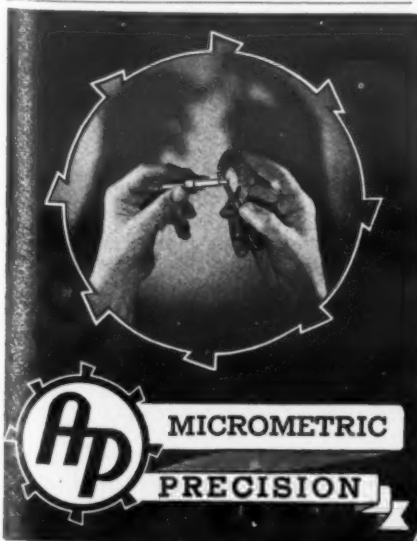
Transmission through the wall of the duct was prevented by a flexible canvas connection between fan and adapter section.

It was found that the formula given holds fairly well for the first few feet, but beyond that point the reductions are less than expected. At the low frequencies this effect is less pronounced, but at the high frequencies the principal reduction occurs in the first few feet of lining.

At the high frequencies, the noise level appears to drop to a certain constant level after which further lengths of lining have little effect. To some extent this effect is observ-

Table 4—Decibel Reductions for Various Size Ducts

Duct Size	Frequency	Measured Reduction Per Ft. (in db.)	Calculated Reduction Per Ft. (in db.)
18 in. x 18 in.	256	0.62	0.34
18 in. x 18 in.	512	1.55	1.37
18 in. x 18 in.	1024	3.64	3.85
18 in. x 18 in.	2048	3.13	3.71
18 in. x 18 in.	4096	2.22	2.89
18 in. x 18 in.	256	0.44	0.31
18 in. x 18 in.	512	1.15	1.73
18 in. x 18 in.	1024	2.36	2.76
18 in. x 18 in.	2048	3.29	2.36
18 in. x 18 in.	4096	2.34	2.15
7 1/2 in. x 17 in.	256	1.10	0.89
7 1/2 in. x 17 in.	512	1.50	2.19
7 1/2 in. x 17 in.	1024	3.65	3.48
7 1/2 in. x 17 in.	2048	4.52	2.97
3 3/4 in. x 17 in.	128	0.13	0.28
3 3/4 in. x 17 in.	256	0.94	0.54
3 3/4 in. x 17 in.	512	3.11	3.03
3 3/4 in. x 17 in.	1024	4.20	4.81
3 3/4 in. x 17 in.	2048	7.76	4.11
8 in. x 10 in.	1000	4.75	4.62
8 in. x 10 in.	1000	5.62	6.61
8 in. x 10 in.	512	1.88	1.98
6 in. x 6 1/2 in.	400	1.2	1.39
6 in. x 6 1/2 in.	1000	4.56	6.19
6 in. x 6 in.	512	2.56	2.92
6 in. x 6 in.	1024	4.00	4.64



Controls...

Every Control, of whatever type, must meet a rigid code of precision standards before it can find its way into service.

Automatic Products Company
2450 North Thirty-Second Street
MILWAUKEE - WISCONSIN

able at the low frequencies, but not to such a pronounced degree. The total noise reading, which is determined almost entirely by the low frequencies, displays this tendency only slightly.

Since the experiments on single frequency tones all show a uniformly increasing decibel attenuation with increasing length, the explanation must be related to the conditions of this particular test.

If the lining attenuates uniform sounds originating at the fan, the only possible explanation is to assume another source of noise contributing to the level at the microphone. The experiments previously described indicate that when the air is blocked off, there is little noise present. This process of elimination indicates that the air itself must be generating new sound as it passes through the duct.

AIR VELOCITY

If this is the case, it might be supposed that the air velocity would be a controlling factor, and that frictional effects at the surface of the lining material would be important. The early experiments were run at high air speeds.

Accordingly experiments were tried over a lower range of air speeds from 700 f.p.m. to 2,100 f.p.m. In all cases the results were of the same order. Measurements were likewise made of the frictional resistance of the lining material.

It was found that this material increased resistance by about 19% more than the unlined duct, an increase which does not appear sufficient to account for the results.

Up to 512 cycles, increased length of lining produces an approximately proportional increase in attenuation, but above this frequency the same non-linearity is observed as in the original experimental system. In all systems tested, this effect has appeared.

PLACED AT OUTLET

Sound absorbing treatment should evidently be placed at the outlet, since only in this way can it act upon sound generated as the air passes through the duct.

For high frequency correction any reasonably efficient material is adequate and a length corresponding to ten diameters is probably ample.

For low frequency correction and reductions in total loudness level a prediction can be based on the formula, but a factor of safety will be necessary until the effect of noise generated along the duct itself upon these lower frequencies is evaluated.

Since most sound absorbent materials of a porous nature are relatively inefficient at the low frequencies, other methods of sound elimination have received attention. This work has not progressed to a point where it can be reported, but it has already been found possible to produce many times the attenuation for a given length at low frequencies by specially designed wave traps and filters as compared with what can be obtained with simple lining material as ordinarily used.

QUESTIONS

Aluminum Trays

No. 3022 (Dealer, New York)—"I am a subscriber to the 'News' and would like to know if you could supply me with the names of several of the largest manufacturers of aluminum trays and grids for automatic refrigerators."

Answer: The following are manufacturers of aluminum trays and grids: Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa. Aluminum Goods Mfg. Co., Manitowoc, Wis. Hoosier Lamp & Stamping Corp., 1511 Read St., Evansville, Ind.

Compressor for Coach

No. 3023 (Reader, Pennsylvania)—"I have been informed that several weeks ago your magazine carried an advertisement or article on small mechanical compressors to be used for refrigeration in trailer coaches."

Answer: An article on a refrigerator for trailers manufactured by the Aerflo Co., 423 Reid Bldg., 138 Cadillac Square, Detroit, Mich., was published in the Nov. 18, 1936 issue of AIR CONDITIONING AND REFRIGERATION NEWS.

Answer: Please furnish us with names of companies manufacturing 'on a production basis,' small steel cabinets suitable for use as beer pre-coolers

Pre-Cooler Cabinets

No. 3024 (Distributor, West Virginia)—"Please furnish us with names of companies manufacturing 'on a production basis,' small steel cabinets suitable for use as beer pre-coolers

with capacities of two half-barrels, approximately 48 inches by 35 inches by 25 inches.

Answer: We suggest that you try the following manufacturers:

Campbell Refrigerator Co., 2526 N. 32nd St., Milwaukee, Wis.
Fogel Refrigerator Co., 519 Bainbridge St., Philadelphia, Pa.
Koch Butchers' Supply Co., 14th, Gentry & Howell Sts., No. Kansas City, Mo.
C. L. Percival Co., 11th & Des Moines Union Tracks, Des Moines, Ia.
Seeger Refrigerator Co., Arcade, Wells & Whitehall Sts., St. Paul, Minn.
Super-Cold Corp., 1020 E. 59th St., Los Angeles, Calif.

Sales in Four States

No. 3025 (Distributor, Louisiana)—"If it is possible for you to do so, please furnish us with information as to Nema electric refrigerator sales in the states of Tennessee, Alabama, Mississippi and Louisiana for the year 1936."

Answer: Your cooperation in furnishing us with these figures will be very much appreciated.

Answer: Below are listed the total Nema electric refrigerator sales for these states for the first eleven months of 1936. Figures for December have not yet been released, but will be published in a future issue of AIR CONDITIONING AND REFRIGERATION NEWS.

Alabama 19,788
Louisiana 17,892
Mississippi 9,889
Tennessee 27,100

Frankenburg Address

No. 3026 (Attorney, Illinois)—"I am in need of the address of the Frankenburg Refrigerating Machinery Co."

Answer: Your publication or records may disclose this information and I shall be pleased to have you write me the address or advise me of someone else I may communicate with for this information.

Answer: In the September 5, 1934, issue of REFRIGERATION NEWS was published the corporate history of the refrigeration industry. In this history the "Frankenburg Refrigeration Co." of Belleville, Ill. is listed, having begun business in 1928, later changing its name to the Modern Refrigeration Co., reorganized as the North Pole Corp., and finally becoming the Belleville Refrigeration Co., which went out of business in June, 1933.

Refrigerator Belts

No. 3027 (Service Engineer, Virginia)—"Please send us list of manufacturers of refrigerator belts."

Answer: Manufacturers of refrigerator belts are:

The Dayton Rubber Mfg. Co., W. Riverview Ave., Dayton, Ohio.
The L. H. Gilmer Co., Keystone & Cottman Sts., Tacony, Philadelphia, Pa.
Goodyear Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Co., 45 Townsend St., Passaic, N. J.
Miller Rubber Products Co., S. High St., Akron, Ohio.

Counter Freezers

No. 3028 (Distributor, West Virginia)—"We would appreciate it very much if you would send us names and addresses of manufacturers of ice cream counter freezers."

Answer: See below

No. 3029 (Dealer, The Netherlands)—"Can you provide us with addresses of manufacturers of complete ice cream cabinets, not yet represented in The Netherlands. Principle voltages are 220 and 125 volts A.C.—50 cy. and 220 volts D.C."

Answer: Manufacturers of counter freezers are as follows:

Mills Novelty Co., 41 Fullerton Ave., Chicago, Ill.
Russ Soda Fountain Co., 5700 Walworth Ave., Cleveland, Ohio.
Sherer-Gillett Co., Kalamazoo Ave., Marshall, Mich.
Super-Cold Corp., 1020 E. 59th St., Los Angeles, Calif.
Taylor Freezer Corp., Beloit, Wis.
Tuthill Pump Co., 132 W. 63rd St., Chicago, Ill.

BUYER'S GUIDE

SPECIAL RATES APPLY TO THESE COLUMNS ONLY
WRITE ADVERTISING DEPT. FOR FULL INFORMATION

MILLS COMPRESSORS

for Commercial Use

Mills Novelty Company • 4100 Fullerton Avenue • Chicago, Illinois



Model No. 500-A

TECUMSEH PRODUCTS CO.
Tecumseh, Mich.

"CHIEFTAIN" QUALITY-BUILT COMPRESSORS and CONDENSING UNITS

All bearings diamond bored. Positive lubrication of parts by newly developed process plus forced feed lubrication in all models.

Sizes: 1/6, 1/5, 1/4, 1/3 h.p.

Write for prices

OFFICES

New York
480 Lexington Ave.

Chicago
Room 2258
La Salle-Wacker Building

Detroit Export
Department
1002 Palms Bldg.

Los Angeles
122 Mariposa St.

St. Louis
577 Arcade Bldg.

U. S. REFRIGERATION THERMOMETERS



All types of Dial Thermometers for refrigeration service, demonstration and original equipment.

Always ACCURATE...
RUGGED...
DEPENDABLE

U. S. GAUGE CO. 44 BEAVER STREET NEW YORK

HIGHEST Filtrine EFFICIENCY

WATER COOLERS

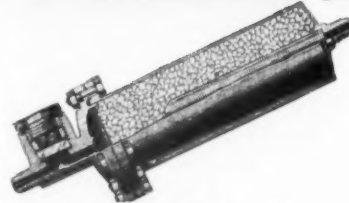
COMMERCIAL — AIR CONDITIONING

From 2 gals. per hour to 500 gals. per minute

WATER FILTERS — STEEL PIPE COILS — SURGE TANKS

FILTRINE MFG. CO., Brooklyn, N. Y.

HENRY Dehydra-Tector



The dryer with the liquid sight port—for determining sufficiency of refrigerant in system. Gas bubbles passing underneath sight port glass indicate shortage of refrigerant. 2 in. O.D. flanged shell with dispersion tube. Dispersion tube results in maximum drying efficiency with minimum pressure drop. Complete range of capacity and fitting sizes. Choice of 5 dehydrants.

HENRY VALVE CO. 1001 19th ST. CHICAGO, ILL.
Stocked By Leading Jobbers

REMPE FIN COILS - for Commercial Use PIPE COILS & BENDS

Rempe Company, 340 N. Sacramento Blvd., Chicago, Illinois

RANCO

New Type KO - - - A "KNOCK-OUT"

Ranco was first with a dependable, compact thermostat for domestic refrigerators. Ranco was first with Stainless Steel. And now Ranco offers an outstanding new Stainless Steel Control for Milk Coolers, Ice Cream Cabinets, Walk-in Coolers, Water Coolers, Air Conditioning and general commercial use.

Ranco Type KO—for either pressure or temperature control—features compact construction, outstanding accuracy, dependability! Differential adjustable as low as 4 pounds, or 4 degrees F., on pressure and temperature controls, respectively. High electrical capacity. Ranco overload protection. Write today for bulletin 691.

RANCO, Inc., Columbus, Ohio

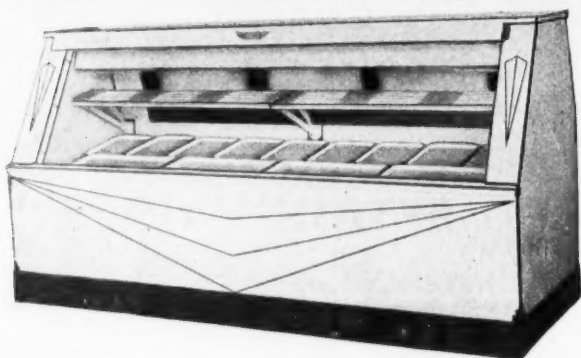


- ACCURACY
- CAPACITY
- DURABILITY

BUYER'S GUIDE

SPECIAL RATES APPLY TO THESE COLUMNS ONLY
WRITE ADVERTISING DEPT. FOR FULL INFORMATION

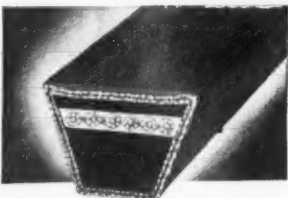
Guaranteed Satisfaction to Seller and User Assured You by Fogel Cases and Coolers. The Stamp of Approval by Fogel Insures You of Quality Throughout by Concentration on a Quality Line Only. The Sale of the Fogel Quality Line Will Earn Larger Profits for You Through Increased Volume.



Write for details today. Our Franchise is valuable.

- 1—Immediate acceptance through exclusive selling features.
- 2—Greater value, quicker results, larger profits.

FOGEL REFRIGERATOR COMPANY
Philadelphia, Pa.



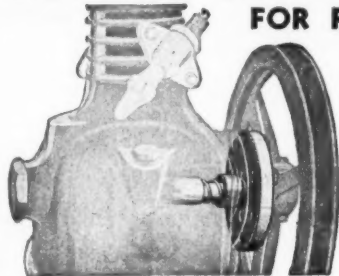
Get a Gilmer V-Belt HAS FIVE FEATURES!

1. Top tension rubber.
2. Endless pulling cord locked in permanent horizontal plane.
3. Brute-strength bottom rubber.
4. Triple-wear double jacket.
5. Controlled stretch.

Lasts longer. Grips tighter. Stays quiet. Sleeved and plainly sized, for all small-unit equipment. Get catalogue.

L. H. GILMER CO., Tacony, Philadelphia

ROTARY SEAL REPLACEMENT UNITS FOR REFRIGERATOR COMPRESSORS

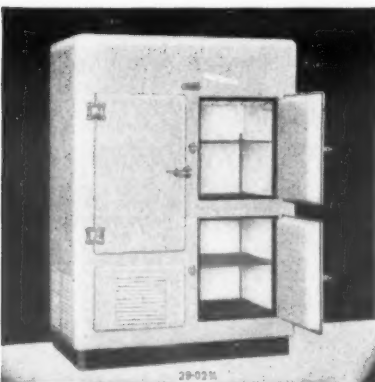


- QUICKLY AND EASILY INSTALLED
- SAVE TIME AND TROUBLE
- PREVENT SHAFT LEAKS

With the many acknowledged advantages ROTARY SEAL UNITS are unquestionably the most perfect replacement seal units available

STRONG, ECONOMICAL, SILENT
GUARANTEED TO GIVE PERFECT SATISFACTION

ROTARY SEAL COMPANY
801 W. Madison St. Chicago, Ill.



STREAMLINED Beauty THIS LINE SELLS ON SIGHT

Weber brings the result of 35 years of successful manufacturing experience. America's most beautiful line of Refrigerator Cases and Commercial Cabinets. Exclusive territories now open. Complete financing plan.

Established 1902 Cable Address "Weberco."

WEBER SHOWCASE & FIXTURE CO., INC.
5700 Avalon Boulevard Los Angeles

ACME PIPE COILS

"THE COILS BY WHICH OTHERS ARE JUDGED"

FLAT
DOUBLE FLAT
BOX OVAL
CYLINDRICAL
RECTANGULAR



HARDENING
ROOM COILS

**ACME
PROCESSED**

JACKSON

ACME INDUSTRIES, Inc.

MICHIGAN

KOLD-HOLD

HAS CONCLUSIVELY PROVEN IN THOUSANDS OF INSTALLATIONS THAT IT IS THE MOST ECONOMICAL, RELIABLE and ADVANTAGEOUS METHOD OF TRUCK REFRIGERATION . . .

KOLD-HOLD MFG. CO., LANSING, MICH.

REFRIGERATION SUPPLY JOBBER ACTIVITIES

Two Office Buildings in Tulsa Conditioned

TULSA, Okla.—The largest air-conditioning plant in the southwest up to the present time is now being installed in the Philtower and Philcade office buildings, two of the city's largest structures, according to Leo H. Gorton, manager of Machine Tool & Supply Co., local refrigeration supplies jobber.

More than 320,000 sq. ft. of office space in the two buildings will be conditioned, Mr. Gorton says. Approximately 2,500 tons of refrigeration will be required in the installation, representing a horsepower load of about 6,000. Cost of the job has been estimated at \$500,000.

The Public Service building, completed last year, was Tulsa's first complete office building installation, Mr. Gorton reports. The plant is rated at 118 tons. Other jobs completed during the year included the National Bank of Tulsa building, 225 tons; First National Bank & Trust Co. building, 75 tons; Clarke Clothiers, Mayo Hotel coffee shop, Hotel Tulsa coffee shop, Adams Hotel coffee shop, Bliss Hotel coffee shop, Walgreen's drug store, Wolfe Bros. clothing store, and the Talbot theaters.

Harry Alter Co. To Handle Texaco Compressor Oils

CHICAGO—The Harry Alter Co., refrigeration and air-conditioning supplies jobbing organization, has taken on the distribution of Texaco Capella compressor oils, according to N. H. Stindler, chief engineer for the Chicago district sales department of the Texas Co.

Texaco oils are featured in a flier which the Alter Co. recently sent out to customers as a forerunner of its spring catalog.

Enochs Sales Co. Opens Branch Sales Agency at Jackson, Miss.

JACKSON, Miss.—Enochs Sales Co. of New Orleans, distributor of commercial refrigeration and air-conditioning parts and supplies, has opened a branch sales agency here.

Airo Supply Acquires New Building For Offices

CHICAGO—Airo Supply Co., refrigeration and air-conditioning jobber, has acquired a long-term lease on an entire building at 2727-32 N. Ashland Ave., C. S. Parnham of the company reports. This new building houses the general offices and purchasing department as well as the store and stockroom.

A one-story building with a floor area of 7,800 sq. ft., the new Airo quarters are centrally located, being just a few minutes drive from the Loop. All departments are lighted by daylight, as the building has practically continuous window space on all four sides as well as skylights running its full length, Mr. Parnham says.

To facilitate handling of materials, the receiving and shipping departments are located on opposite sides of the stock room. Gaskets, fittings, belts, and similar articles are kept within easy view of the sales counter in order to simplify identification and comparison.

St. Louis Parts Jobber Builds Addition to Warehouse

ST. LOUIS—Brass & Copper Sales Co., local refrigeration and air-conditioning parts jobber, is building a large addition to its present office and warehouse space to extend its refrigeration department, according to H. H. Hubbell, department manager.

The addition is expected to be ready for occupancy about April 1.

Borg-Warner to Open Parts Branch in Detroit

DETROIT—Borg-Warner Service Parts Co., Chicago, will open a branch office at 5013 John R. St. here Feb. 10 under the supervision of district manager F. M. Eversden.

The Detroit branch will stock a complete line of replacement parts, accessories, and supplies for refrigeration, air conditioning, and automatic heating, according to R. P. Johnson, head of the company's refrigeration, air-conditioning, and heating division.

Ray Polley of Mills Novelty Tells Servicemen Some Reasons for Subscribing to the 'News'

Mills Novelty Co.
4100 Fullerton Ave.
Chicago

Subscription Manager:

We are enclosing with this letter a copy of the letter that we are sending to our entire service organization together with the circulars that you sent to us for that purpose.

We are very interested in having our service representatives subscribe to the AIR CONDITIONING AND REFRIGERATION NEWS, as we are of the opinion that it is very necessary for them to keep up with the industry, and feel that by doing so they will be better fitted to render modern, efficient service to our customers.

This arrangement of handling we are confident will meet with your approval.

R. F. POLLEY,
Sales Manager, Commercial Refrigeration Division

TO ALL REFRIGERATION SERVICEMEN:

Subject: Keeping in Step with the Big Parade.

The refrigeration industry is changing every day—new designs—new applications are popping up constantly—and last, but not least, the lusty infant of the industry, air conditioning, is growing with phenomenal speed.

We of the industry, if we are to keep abreast of the times, must continually use every means at our command to broaden our knowledge of the various phases of refrigeration.

Fortunately, there are men in this industry who are devoting their lives to gathering information which will keep up abreast with the progressive step of the industry.

Each week they bring out a publication which keeps us fully informed of every new development. Certainly a group of men who are rendering us a service of this kind deserve our most serious considerations and, like-

wise, our sincere thanks and congratulations on their splendid work.

In making these statements, we are referring directly to our old friends, the editorial staff of the AIR CONDITIONING AND REFRIGERATION NEWS. Many of you men who are connected with our service and distributing organization have long since learned the benefits to be derived from this publication.

However, there may be many of you who have not given this paper your most serious consideration and, therefore, do not realize fully the benefits to be derived.

As you become more involved as a distributor of our products, you will more keenly appreciate how imperative it is that you keep abreast with the developments of the refrigeration industry. We can think of no other weekly publication which will prove as beneficial to you as the AIR CONDITIONING AND REFRIGERATION NEWS in accomplishing this purpose.

Therefore, in the spirit of helpful suggestion to enable you to broaden your knowledge, and, by doing so, enable you to achieve greater accomplishments in this industry, we feel that we are rendering you a real service in requesting that you subscribe to the AIR CONDITIONING AND REFRIGERATION NEWS.

With this thought in mind, we are sending you, enclosed with this letter, the literature sent to us by the editorial staff, which will give you complete information on your subscriptions for 1937. If you are already a subscriber to this publication, you will obviously want to renew your subscription at once. If you have never subscribed to this paper, we want to take this opportunity to urge you to seriously consider doing so, for we sincerely believe that it is imperative that you do if you are to keep in step with the parade.

MILLS NOVELTY CO.

Eugene P. Farris New Specialty Sales Manager For Emerson

ST. LOUIS—Appointment of Eugene P. Farris as manager of specialty sales to succeed H. L. Parker, Jr., who has resigned, was announced last week by the officials of Emerson Electric Mfg. Co.

The company has just issued a catalog on its 1937 line of fans, together with a special booklet describing its advertising and sales promotional material available for use in its coming sales campaign, said to be the largest in its history.

U.S. Rubber Products Lists Line in New 1937 Catalog

NEW YORK CITY—United States Rubber Products, Inc., has just brought out its new "U. S. Hose Catalog" for 1937, listing and describing the complete line of rubber equipment which it manufactures for industrial use.

For the refrigeration field, products include rubber hose, door gaskets, breaker strips, insulated wire, compressor gaskets, packing, sponge rubber insulating tubes, and moulded rubber products.

Krich-Radisco Meeting Draws 400 Dealers

NEWARK—Four hundred dealers of Krich-Radisco, Inc., Kelvinator distributor in this territory, were introduced to Kelvinator's 1937 appliance line and the year's advertising and sales promotion plans at a series of luncheon and dinner meetings extending throughout the week of Jan. 18.

The presentation was held in Krich-Radisco's new auditorium. The various appliances were placed on a revolving stage, and each one spotlighted as it came into view.

Paul R. Krich, vice president in charge of sales for the distributorship, opened the meetings and introduced the various speakers.

Jack Crossin, Kelvinator regional manager, discussed the importance of the Nash-Kelvinator merger, and outlined the benefits which the consolidation would bring to Kelvinator dealers.

Harry Stratton, Larry Bagg, and Stan Bernhardt, eastern representatives for the Kelvinator division, presented the electric ranges, laundry equipment, and gas ranges, respectively.

Johnson Scott and Chester Norton, Eastern district managers, presented the new refrigerator line and explained the operation of Kelvinator-Radisco finance plans. James O'Neill presented the advertising and promotion plans. Max H. Krich, president of the distributorship, closed the meetings.

When the week ended, Krich-Radisco was able to report the largest initial volume of orders that the company had ever received.

Walway Moves Detroit Plant To Eight Mile Road Site

DETROIT—The Walway Co., manufacturer of refrigerator deodorizers, metal stampings, and angle iron parts, has moved into a new plant at 19270 Eight Mile Rd. Former location of the company was at 8737 Kercheval Ave. here.

The new plant, located on a 4½ acre plot, has a floor space of approximately 15,000 sq. ft.

E. Hemingway is president of the company, which was organized in 1932 as a partnership, and incorporated three years later. W. E. Walker, Jr., is vice president and sales manager, and W. H. Ashe is secretary.

Started with an employee personnel of only three men, the plant now employs more than 40, Mr. Ashe said.

Selling direct to manufacturers through its own sales force, the company has experienced such demand for stampings and angle irons, for refrigeration and air-conditioning work, that it was forced to let deodorizer sales lag, Mr. Ashe stated.

It is believed the new plant, however, will permit full production of the deodorizers, as well as of a new electric oil meter gauge which the company plans to introduce for use in the oil burner industry.

Housewife's Note Gives Service Man Diagnosis—& Headache

WESTFIELD, N. J.—When a service man from Van Brothers, local refrigerator dealer, answered a service call to a home recently, he found that the housewife had attached to the refrigerator the following diagnosis of its ailments:

"The box is as temperamental as a movie actor. Saturday night it was driving us crazy with squealing and grinding. It grinds in starting. Sometimes it swings right into a quiet running tone, but when it doesn't it gets hot, and when it heats it squeals. If it gets hot enough, it won't turn off. It usually squeals when turning off, if no other time."

Electrical Inspectors Seek Underwriters Approval Of All Materials

DURHAM, N. C.—A resolution requesting the Underwriters Laboratories of New York City to extend its standards and legal service to cover all electrical materials was passed by the North Carolina chapter of the International Association of Electrical Inspectors at its annual convention here recently. Another resolution urged extending licensing requirements for electrical installations, now limited to cities, to rural areas.

Leonard Convention Inspiration To Shapiro Co. Salesmen

NEWBURGH, N. Y.—So high ran the enthusiasm of the representatives of the Shapiro Sporting Goods Co. who attended the 1937 Leonard convention in Detroit, that during the day following their return, they sold seven dealers a complete line of 1937 models without using an illustration or picture of the new line, according to H. Gabrilove of the distributorship.

CLASSIFIED ADVERTISING

RATES: Fifty words or less, one insertion, \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning and Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

SALES MANAGER wanted for large manufacturer and retailer of electric refrigerators, commercial equipment, etc. Must have proven record and be a capable organizer and be thoroughly competent to handle twelve salesmen. Best of references necessary. This is a steady position. Company located in the Northwest. Box 899, Air Conditioning and Refrigeration News.

PRODUCTION MANAGER, with experience on manufacture of refrigeration equipment. Advise fully previous experience, education, references and salary desired. **KOLD-HOLD MANUFACTURING CO.**, Lansing, Michigan.

POSITIONS WANTED

CAPABLE, UNMARRIED young man, trained by Refrigeration and Air Conditioning Institute, Chicago, desires to make connections with prominent firm for refrigeration service work. Able to figure heat loads for various installations. Report of record with Institute will be furnished upon investigation. Can give reliable reference as to ability and initiative. Box 898, Air Conditioning and Refrigeration News.

DISTRIBUTOR SALES MANAGER with ten years' experience with large distributors and manufacturers of domestic and commercial refrigeration desires position with well-rated distributor or utility. Would consider position with manufacturer to establish and develop distributors and dealers. Highly successful in developing effective sales promotion plans and organizing distributor and dealer salesmen.

Wide experience in utility and department store merchandising of appliances. Now operating in Chicago with dealers for national organization. Legitimate reason for change. Strict investigation of sales record and personal ability invited. Best of references. Box 897, Air Conditioning and Refrigeration News.

EQUIPMENT WANTED

WANTED TO BUY: Commercial compressors, new or used; also complete condensing units and accessories; also commercial and domestic motors. Prices and particulars. Box 895, Air Conditioning and Refrigeration News.

ATTENTION—DAIRY, REFRIGERATION and case men. I have to offer the following Frigidaire units. Model A twin cylinder in perfect shape, at \$22.50 per unit complete. Also model A 125, at \$25.00 per unit. These units have Frigidaire one quarter H.P. motors, sixty cycle, 110/220, with cold control switch and contain SO. Please send deposit and quantity of units wanted. Will ship balance C.O.D. Freight charges collect. **REFRIGERATION SUPPLY JOBBERS**, 5622 Woodland Ave., Cleveland, Ohio.

EQUIPMENT FOR SALE

EXPORTERS—DEALERS. Rebuilt Refrigerators consisting of Norges, Westinghouses, Frigidaire, General Electric; others from \$27.50. Rebuilding done in our own factory on premises. Also carry large stock brand new refrigerators, standard makes, in original cases; for promotional sales. Prices will astound you. Write for information. **INTERSTATE REFRIGERATOR CORP.**, 96 Fifth Ave., New York City.

REPAIR SERVICE

MAJESTIC-GENERAL ELECTRIC-SERVEL hermetic units repaired and exchanged. Majestic with six months' factory guarantee \$18.50. General Electric monitor top domestic units with one year factory guarantee \$25.00. Servel hermetic units with one year factory guarantee \$18.50. Prices f.o.b. our factory. Every unit undergoes complete tests for temperature, cycling, wattage consumption and quietness on genuine test equipment. **REFRIGERATION MAINTENANCE CORP.**, 365 E. Illinois St., Chicago, Ill.

MAJESTIC & GRIGSBY GRUNOW refrigerator and radio parts service. We have purchased all of the old Grigsby-Grunow Majestic Refrigerator and Radio Parts Service. The only original and genuine factory parts and service anywhere in the country. Beware of inferior replacements and parts. **G. & G. CO.**, 5801 Dickens Ave., Chicago.

FREE—Did you get yours yet? Price list on repairing electric motors for: refrigerators—oil burners—stokers—water coolers—wash machines and air condition motors. Out of town motors are picked up and delivered by our motor transportation service. Write for our free dealers' price list. **P. J. QUINN'S SONS, INC.**, Electric Motor Repairing, 166 Vernon Ave., Long Island City, N. Y.

MAJESTICS EXCHANGED or rebuilt \$18.50. Genuine Majestic repair and test equipment and parts used throughout. General Electric household units rebuilt \$25. Prices f.o.b. Chicago. Six months' guarantee. Complete Majestic parts price list on request. **REFRIGERATION PRODUCTS, INC.**, 122 West Illinois St., Chicago, Illinois.

SCHOOLS

OUR STUDENTS include service men and executives already engaged in refrigeration and air conditioning, also men learning in order to enter this field. We teach our students to reason out their problems rather than give them complicated rules. For information write to **DETROIT SCHOOL OF REFRIGERATION AND AIR CONDITIONING**, 4123 Grand River, Detroit, Mich.

PATENTS

Issued January 5, 1937

2,066,312 AIR CONDITIONED DISPLAY TABLE. James E. Bales, Aurora, Ill., assignor to Lyon Metal Products, Inc., Aurora. Application Sept. 15, 1933. Serial No. 689,537. 5 Claims. (Cl. 62—89.5)

2,066,334 REFRIGERATION. Frederic L. Chase, Dayton, assignor to General Motors Corp., Dayton. Application Aug. 31, 1935. Serial No. 38,800. 19 Claims. (Cl. 62—170)

2,066,653 HUMIDIFIER. Ferris N. Smith, Grand Rapids, Mich. Application March 21, 1935. Serial No. 12,165. 19 Claims. (Cl. 261—115)

2,066,660 REFRIGERATION. Albert R. Thomas, Evansville, Ind., assignor, by mesne assignments, to Servel, Inc., Dover, Del. Application Nov. 12, 1932. Serial No. 642,333. Renewed Nov. 23, 1934. 19 Claims. (Cl. 62—119.5)

2,066,688 AIR CONDITIONING APPARATUS. Lester S. Kellholtz, Detroit, assignor, by mesne assignments, to Borg-Warner Corp., Application Dec. 20, 1933. Serial No. 703,279. 14 Claims. (Cl. 261—115)

2,066,689 AIR CONDITIONING APPARATUS. Lester S. Kellholtz and Le Roy A. Volberding, Detroit, assignors, by mesne assignments, to Borg-Warner Corp., Application Jan. 19, 1934. Serial No. 707,294. 1 Claim. (Cl. 261—115)

2,066,692 VALVE. Edward M. May, Birmingham, Mich., assignor, by mesne assignments, of one-half to Borg-Warner Corp., Application May 31, 1934. Serial No. 728,242. 3 Claims. (Cl. 137—68)

2,066,738 THERMOSTAT. William A. Ray, San Francisco, assignor to General Controls Co., Application April 30, 1935. Serial No. 18,984. 6 Claims. (Cl. 200—139)

2,066,817 AIR CONDITIONING, HEATING, AND COOLING UNITS. Fred M. Young, Racine, Wis., assignor to Young Radiator Co., Racine. Application March 9, 1935. Serial No. 10,221. 3 Claims. (Cl. 257—137)

2,066,832 HUMIDIFYING AND TEMPERATURE CONTROL APPARATUS FOR CITRUS FRUIT STORAGE AND LIKE STRUCTURES. Norman H. Gay, Los Angeles. Application March 1, 1935. Serial No. 8,967. 6 Claims. (Cl. 133—22)

2,067,004 REFRIGERATING APPARATUS. Julius J. Spengler, Chicago. Application May 13, 1935. Serial No. 21,117. 9 Claims. (Cl. 257—202)

2,067,074 FREEZING TRAY. Ralph H. Chilton, Dayton, assignor to General Motors Corp., Detroit. Application Feb. 26, 1934. Serial No. 712,885. 6 Claims. (Cl. 62—108.5)

2,067,160 AIR CLEANER AND SILENCER. George C. Rensink, Denver. Application July 22, 1935. Serial No. 32,549. 7 Claims. (Cl. 133—72)

DESIGNS

102,657. DESIGN FOR A REFRIGERATION TRAY. Lewis H. Scurlock, Chicago. Application Oct. 1, 1936. Serial No. 65,098. Term of patent 14 years.

102,659. DESIGN FOR A REFRIGERATOR. George W. Walker, Detroit. Application June 18, 1936. Serial No. 63,364. Term of patent 7 years.

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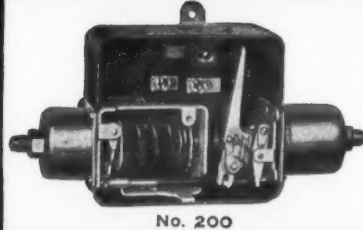


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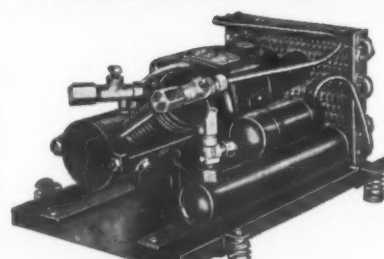
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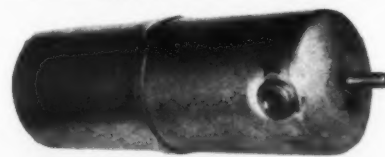
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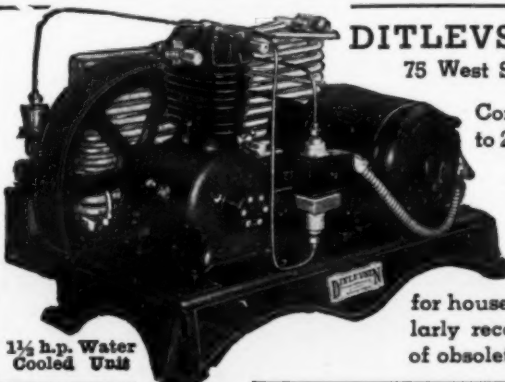
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